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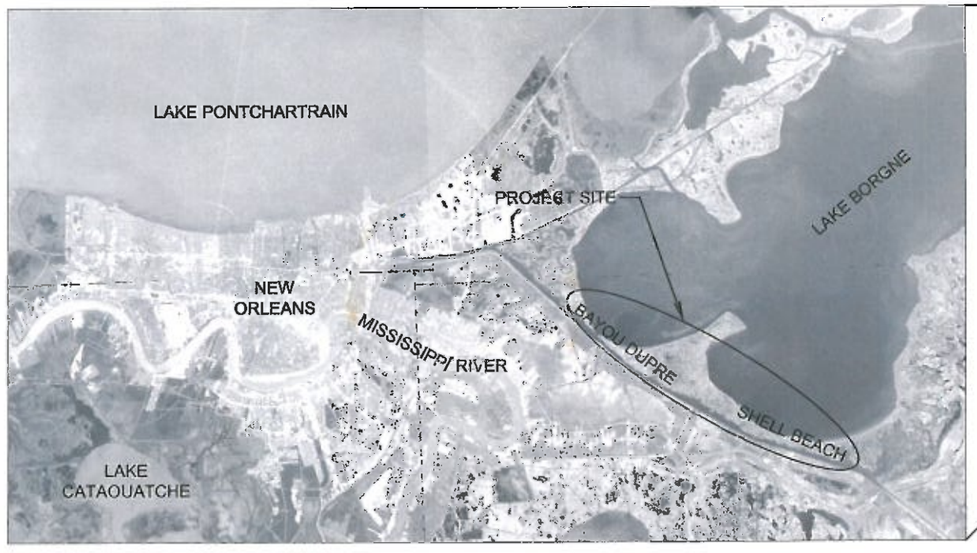
STATE OF LOUISIANA
DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION

LAKE BORGNE
SHORELINE PROTECTION
PO-30
ST. BERNARD PARISH



STATE OF LOUISIANA
SHANNON McCLAIN HAYNES
License No. 30552
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
2/14/07

FEDERAL PROJECT SPONSOR

STATE PROJECT SPONSOR

CED DIRECTOR

CED ENGINEER MANAGER

CED PROJECT ENGINEER

TYPE OF CONSTRUCTION

CLASSIFICATION III (HEAVY CONSTRUCTION)
SHORELINE PROTECTION

REV.	DATE	DESCRIPTION	BY

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

DRAWN BY: SHANE FAUST | DESIGNED BY: SHANNON HAYNES, P.E.

LAKE BORGNE
SHORLINE PROTECTION

STATE PROJECT NUMBER: PO-30
FEDERAL PROJECT NUMBER: PO-30
APPROVED BY: LUKE LE BAS, P.E.

TITLE SHEET

DATE: FEBRUARY 2007
SHEET 1 OF 34

GENERAL NOTES

1. ALL ELEVATIONS ARE GIVEN IN THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) U.S. SURVEY FEET (FEET). ALL HORIZONTAL COORDINATES ARE GIVEN IN THE NORTH AMERICAN DATUM OF 1983 (NAD83, LOUISIANA STATE PLANE SOUTH ZONE U.S. FEET).
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NAVIGATING FROM A NAVIGABLE WATER BODY TO THE SITE. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR NAVIGATING WITHIN THE LIMITS OF THE PROJECT SITE AND DREDGING ONLY WITHIN THE LIMITS OF THE FLOTATION AND ACCESS CHANNELS. THE LDNR PROJECT ENGINEER OR INSPECTOR SHALL MONITOR EQUIPMENT OPERATIONS DURING CONSTRUCTION.
3. ALL EQUIPMENT SHALL BE FLOATING AT ALL TIMES DURING TRANSIT TO AND FROM THE PROJECT SITE.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING ALL THE LANDOWNERS, UTILITIES AND PIPELINE COMPANIES IDENDIFIED IN THE SPECIFICATIONS AT LEAST 5 WORKING DAYS PRIOR TO MOBILIZATION. ALL UNDERGROUND PIPELINES AND UTILITIES SHALL BE MARKED WITH BUOYS BY THE CONTRACTOR. THE CONTRACTOR SHALL MAINTAIN BUOYS DURING CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN THE CLEARANCES FROM THE PIPELINES SET FORTH IN THE PLAN DRAWINGS OR IN THE BID DOCUMENTS. NO EXCAVATION IS ALLOWED WITHIN ANY AREA RESTRICTED BY THE PIPELINE COMPANIES AND SET FORTH ON THE PLANS. PIPELINE LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATIONS. THE OWNER IS NOT LIABLE FOR EXACT LOCATIONS. THE CONTRACTOR MUST CALL LOUISIANA ONE CALL AT 1-800-272-3020 AT LEAST 5 WORKING DAYS PRIOR TO MOBILIZATION.
5. THE PLANS AND BID DOCUMENTS ARE COMPLEMENTARY; WHAT IS REQUIRED IN ONE IS AS BINDING AS IF REQUIRED BY ALL. CLARIFICATIONS, INTERPRETATIONS, OR NOTIFICATIONS OF MINOR VARIATIONS AND DEVIATIONS IN THE CONTRACT DOCUMENTS WILL BE ISSUED BY THE ENGINEER, IF NECESSARY.
6. THE ELEVATIONS SHOWN ON PLANS ARE BASED ON SURVEYS PERFORMED BETWEEN 1/27/03 AND 3/21/05 BY B.F.M. CORPORATION, L.L.C. AND SIGMA CONSULTING, INC., RESPECTIVELY, FOR LDNR.
7. THE ALIGNMENT FOR THE ROCK BREAKWATERS AND BACK-TO-BACK SHEET PILE STRUCTURE MAY BE REVISED BY THE ENGINEER BEFORE CONSTRUCTION TO REFLECT CHANGES IN FIELD CONDITIONS.
8. ANY DAMAGE TO EXISTING U.S. COAST GUARD NAVIGATION AIDS OR PRIVATE NAVIGATION AIDS SHALL BE REPAIRED BY THE CONTRACTOR TO U.S. COAST GUARD STANDARDS AT THE EXPENSE OF THE CONTRACTOR.
9. THE ESTIMATED ROCK QUANTITIES SHOWN IN THE SUMMARY OF ESTIMATED QUANTITIES ARE FOR BIDDING PURPOSES ONLY AND CALCULATED ACCORDING TO THE CONDITIONS SURVEYED FROM 1/27/03 TO 3/21/05. THE ROCK QUANTITIES WERE CALCULATED USING THE END AREA METHOD OF SECTIONS AT THE BEGINNING, END, AND EVERY SURVEY TRANSECT ALONG THE ROCK BREAKWATER ALIGNMENT. THE ROCK QUANTITIES ASSUMED VARYING RATES OF SETTLEMENT FOR THE BREAKWATERS AS SHOWN IN THE FINAL DESIGN REPORT. THE QUANTITIES REQUIRED FOR CAPPING OFF THE SHEET PILE STRUCTURE WERE CALCULATED ASSUMING AN UNIFORM 2.5' LAYER OF STONE OVER THE ENTIRE STRUCTURE. AN IN-PLACE UNIT WEIGHT OF 1.5 TONS/CU. YDS. WAS ASSUMED FOR THE ROCK. ACTUAL QUANTITIES WILL BE BASED ON BARGE DISPLACEMENT MEASUREMENTS. SEE THE TECHNICAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. THE OWNER RESERVES THE RIGHT TO ADJUST QUANTITIES HIGHER OR LOWER WITHOUT ADJUSTMENT OF THE UNIT PRICE.
10. MATERIAL STOCKPILED LAKEWARD OF FLOTATION AND ACCESS CHANNELS SHALL BE DEPOSITED IN THE AREAS SHOWN ON THE PLANS AND PLACED SUCH THAT IT IS READILY AVAILABLE TO BE BACKFILLED. ONLY MATERIAL DREDGED FROM FROM THE ACCESS AND FLOTATION CHANNELS SHALL BE BACKFILLED INTO THE CHANNELS.
11. MEAN HIGH WATER (MHW) AND MEAN LOW WATER (MLW) WERE CALCULATED FROM THE NOAA BUOY STATION 42007 LOCATED SOUTHEAST OF BILOXI USING 1993 TO 2002 DATA.
12. THE CONTRACTOR SHALL PERFORM A MAGNETOMETER SURVEY OF THE ACCESS CHANNELS, FLOTATION CHANNELS, AND SHEET PILE STRUCTURE. MAGNETOMETER LINES SHALL BE RUN ALONG THE ALIGNMENT OF THE ACCESS CHANNELS, FLOATATION CHANNELS, AND SHEET PILE STRUCTURE. ADDITIONAL MAGNETOMETER LINES SHALL BE RUN PERPENDICULAR TO THE ALIGNMENT OF THE ACCESS CHANNELS, FLOTATION CHANNELS, AND SHEET PILE STRUCTURE. THESE LINES SHALL EXTEND OUT 25.0' FROM THE EDGE OF THE TEMPORARY SPOIL PLACEMENT AND BE SPACED A MAXIMUM OF 500.0' APART. DRAWINGS SHOWING THE TRACK LINES, MAGNETOMETER HITS, COORDINATES, AMPLITUDE, SIGNATURE TYPE, AND SIGNATURE WIDTH OF ALL MAGNETOMETER HITS SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO MOBILIZATION. THE DRAWING SHALL BE STAMPED BY A REGISTERED PROFESSIONAL SURVEYOR LICENSED IN LOUISIANA. SEE SECTION "TECHNICAL SPECIFICATIONS" FOR ADDITIONAL REQUIREMENTS.
13. THE ROCK BREAKWATERS NEAR THE FORMER NAVAL FACILITY AT OLD SHELL BEACH SHALL BE CONSTRUCTED USING END-ON-CONSTRUCTION TECHNIQUES AS SPECIFIED IN THE END-ON-CONSTRUCTION DETAIL PROVIDED IN THESE PLANS.
14. ANY REFERENCES TO MAINTENANCE OF THE ROCK BREAKWATERS IN THESE PLANS ARE FOR INFORMATIONAL PURPOSES AND ARE NOT INCLUDED FOR CONSTRUCTION AT THIS TIME.
15. CONDITIONS TO AVOID IMPACTS TO MANATEES: ALL CONTRACT PERSONNEL ASSOCIATED WITH THE PROJECT WILL BE INFORMED OF THE POTENTIAL PRESENCE OF MANATEES AND THE NEED TO AVOID COLLISIONS WITH MANATEES, WHICH ARE PROTECTED UNDER THE MARINE MAMMAL PROTECTION ACT OF 1972 AND THE ENDANGERED SPECIES ACT OF 1973. ALL CONSTRUCTION PERSONNEL ARE RESPONSIBLE FOR OBSERVING WATER-RELATED ACTIVITIES FOR THE PRESENCE OF MANATEE(S). TEMPORARY SIGNS WILL BE POSTED PRIOR TO AND DURING ALL CONSTRUCTION/DREDGING ACTIVITIES TO REMIND PERSONNEL TO BE OBSERVANT FOR MANATEES DURING ACTIVE CONSTRUCTION/DREDGING OPERATIONS OR WITHIN VESSEL MOVEMENT ZONES (I.E. WORK AREA), AND AT LEAST ONE SIGN WILL BE PLACED WHERE IT IS VISIBLE TO THE VESSEL OPERATOR. SILTATION BARRIERS, IF USED, WILL BE MADE OF MATERIAL IN WHICH MANATEES COULD NOT BECOME ENTANGLED, AND WILL BE PROPERLY SECURED AND MONITORED. IF A MANATEE IS SIGHTED WITHIN 100 YARDS OF THE ACTIVE WORK ZONE, SPECIAL OPERATION CONDITIONS WILL BE IMPLEMENTED, INCLUDING: NO OPERATION OF MOVING EQUIPMENT WITHIN 50 FEET OF MANATEE; ALL VESSELS WILL OPERATE AT NO WAKE/IDLE SPEEDS WITHIN 100 YARDS OF THE WORK AREA; AND SILTATION BARRIERS, IF USED, WILL BE RE-SECURED AND MONITORED. ONCE THE MANATEE HAS LEFT THE 100-YARD BUFFER ZONE AROUND THE WORK AREA ON ITS OWN ACCORD, SPECIAL OPERATION CONDITIONS ARE NO LONGER NECESSARY, BUT CAREFUL OBSERVATIONS WOULD BE RESUMED. ANY MANATEE SIGHTING WILL BE IMMEDIATELY REPORTED TO THE U.S. FISH AND WILDLIFE SERVICE (337/291-3100) AND THE LOUISIANA DEPARTMENT OF WILDLIFE AND FISHERIES, NATURE HERITAGE PROGRAM (225/765-2821).
16. CONDITIONS TO AVOID IMPACTS TO STURGEON WHILE DREDGING AND BACKFILLING THE ACCESS AND FLOTATION CHANNELS: THE CONTRACTOR WILL INDUCE GULF STURGEON TO LEAVE THE IMMEDIATE WORK AREA PRIOR TO DREDGING REGARDLESS OF WATER DEPTH OR TIME OF YEAR. AT THE COMMENCEMENT OF DREDGING, THE BUCKET WILL BE DROPPED INTO THE WATER AND RETRIEVED EMPTY ONE TIME. AFTER THE BUCKET IS DROPPED AND RETRIEVED, A ONE-MINUTE NO DREDGING PERIOD WILL BE OBSERVED. DURING THIS NO DREDGING PERIOD, PERSONNEL WILL CAREFULLY OBSERVE THE WORK AREA IN AN EFFORT TO VISUALLY DETECT GULF STURGEON. IF GULF STURGEONS ARE SIGHTED, NO DREDGING WILL BE INITIATED UNTIL THEY HAVE LEFT THE WORK AREA. IF THE WATER TURBIDITY MAKES SUCH VISUAL OBSERVATIONS IMPOSSIBLE, DREDGING WORK WILL PROCEED AFTER THE ONE-MINUTE NO DREDGING PERIOD. IF, AT ANY TIME, MORE THAN FIFTEEN MINUTES ELAPSES WITHOUT DREDGING THEN THE EMPTY BUCKET DROP/RETRIEVAL PROCESS WILL BE PERFORMED AGAIN PRIOR TO INITIATING DREDGING. DURING THE WINTER, JUVENILE AND ADULT GULF STURGEON USE ESTUARINE AND MARINE HABITATS FOR FORAGING ACTIVITIES. IN SPRING STURGEON MIGRATE TO RIVER MOUTHS AND UPSTREAM AREAS IN SEARCH OF SPAWNING AND RESTING HABITAT. IN FALL, AFTER FASTING ALL SUMMER IN THE RIVERS, STURGEON MIGRATE BACK INTO THE ESTUARIES AND MARINE HABITATS IN SEARCH OF SUITABLE BENTHIC PREY SPECIES, WHICH CONSTITUTE THEIR PRIMARY FOOD SOURCE.
17. AVOID IMPACT TO EXISTING VEGETATION: FOR PROTECTION OF EXISTING VEGETATION, ACCESS TO OR MOVEMENTOUTSIDE OF THE DEFINED PROJECT SITE SHALL GENERALLY BE PROHIBITED WITHIN VEGETATED AREAS FOR ALL PERSONNEL OR MATERIAL ACCESS OR STORAGE.

SUMMARY OF ESTIMATED QUANTITIES
BASE BID

ITEM No.	DESCRIPTION	UNIT	ESTIMATED QUANTITY
1	MOBILIZATION AND DEMOBILIZATION	LUMP SUM	1
2	SURVEYING	LUMP SUM	1
3	ACCESS AND FLOTATION CHANNELS	LUMP SUM	1
4	GEOGRID COMPOSITE	SQUARE YARDS	80,261
5	250 LB CLASS ROCK	TON	172,432
6	SETTLEMENT PLATES	EACH	30
7	PERMANENT WARNING SIGNS	EACH	31
8	STEEL SHEET PILE	SQUARE FEET	112,546
9	GALVANIZED STEEL TUBE WALERS	EACH	3,242
10	GALVANIZED STEEL WALER SPLICES	EACH	203
11	TIE ROD ASSEMBLIES	EACH	203
12	SAND FILL	CUBIC YARDS	4,650

QUANTITIES SHOWN ARE FOR BID PURPOSES ONLY AND WERE CALCULATED ACCORDING TO CONDITIONS SURVEYED FROM 2/25/02 TO 3/21/05. THE OWNER RESERVES THE RIGHT TO ADJUST QUANTITIES HIGHER OR LOWER WITHOUT ADJUSTMENT OF THE UNIT PRICE.

STATE OF LOUISIANA
SHANNON McCLAIN HAYNES
License No. 30552
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
2/14/07

REV.	DATE	DESCRIPTION	BY

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

DRAWN BY: SHANE FAUST | DESIGNED BY: SHANNON HAYNES, P.E.

LAKE BORGNE
SHORELINE PROTECTION

STATE PROJECT NUMBER: PO-30
FEDERAL PROJECT NUMBER: PO-30
APPROVED BY: LUKE LE BAS, P.E.

GENERAL NOTES
DATE: FEBRUARY 2007
SHEET 2 OF 35

EXISTING SOIL BORINGS		
PLATE	EASTING	NORTHING
B1	3,751,596.89	533,181.62
B2	3,752,656.70	531,237.52
B3	3,754,105.89	528,183.21
B4	3,756,072.10	533,396.73
B5	3,757,857.11	525,935.03
B12	3,758,819.92	525,383.98
B13	3,751,953.43	532,484.12
B14	3,752,269.15	531,814.39
B15	3,753,154.31	530,316.58
B16	3,753,636.90	529,334.85

LAKE BORGNE

STA. 0+00
STA. 10+00
STA. 20+00
STA. 30+00
STA. 40+00
STA. 50+00
STA. 70+00
STA. 75+00
STA. 80+00
STA. 85+00
STA. 90+00
STA. 105+00
STA. 115+00
STA. 125+00
STA. 135+00
STA. 145+00
STA. 155+00

TEMPORARY BENCHMARK TBM1
X = 3,750,912.15
Y = 535,484.95

ROCK BREAKWATER (TYP.)

MARTELLO'S CASTLE

BACK-TO-BACK STEEL SHEETPILE STRUCTURE

EXISTING SOIL BORING (TYP.)

BASELINE

B1 B13 B14 B2 B15 B16 B3 B4 B5 B12

TEMPORARY BENCHMARK TBM2
X = 3,752,471.35
Y = 529,690.28

BACK-TO-BACK STEEL SHEETPILE STRUCTURE

EXISTING USACE ROCK BREAKWATER

TEMPORARY BENCHMARK TBM3
X = 3,754,748.18
Y = 527,635.94

TEMPORARY BENCHMARK TBM4
X = 3,755,440.52
Y = 527,011.20

TEMPORARY BENCHMARK TBM5
X = 3,760,211.38
Y = 524,276.80

LDNR-CED SECONDARY MONUMENT "PO-30-SM-01"
X = 3,755,141.43
Y = 525,391.96

BAYOU DUPRE

MISSISSIPPI RIVER GULF OUTLET

STATE OF LOUISIANA
SHANNON McCLAIN HAYNES
License No. 30552
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
2/19/07

1000' 500' 0' 1000' 2000'

LEGEND

- ROCK BREAKWATER
- SHEETPILE
- EXISTING SOIL BORING
- EXISTING USACE ROCK BREAKWATER
- SURVEY TRANSECTS
- BASELINE
- BENCHMARK/MONUMENT

NOTES:
1. MONUMENT DATA SHEETS ARE INCLUDED IN THE SPECIFICATIONS.
2. TEMPORARY BENCHMARKS MAY EXIST OR REQUIRE REPLACEMENT BY CONTRACTOR.
3. BORING LOGS ARE INCLUDED IN THE SPECIFICATIONS.
4. NEW SURVEYS SHALL NOT EXTEND PAST STATION 135+00.

REV.	DATE	DESCRIPTION	BY

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

DRAWN BY: SHANE FAUST | DESIGNED BY: SHANNON HAYNES, P.E.

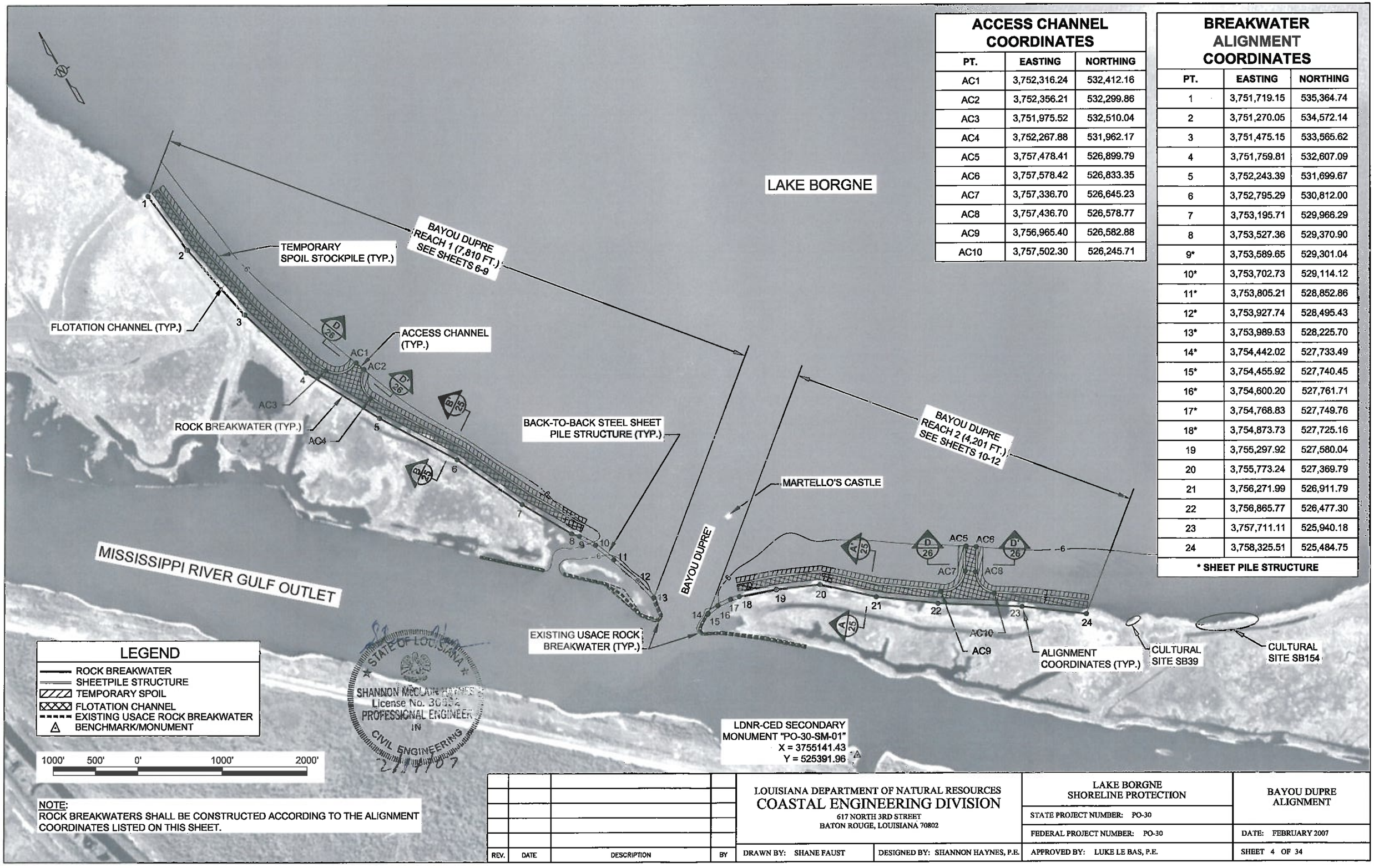
LAKE BORGNE
SHORLEINE PROTECTION

STATE PROJECT NUMBER: PO-30
FEDERAL PROJECT NUMBER: PO-30

APPROVED BY: LUKE LE BAS, P.E.

BAYOU DUPRE SURVEY & SOIL BORING LAYOUT

DATE: FEBRUARY 2007



ACCESS CHANNEL COORDINATES

PT.	EASTING	NORTHING
AC1	3,752,316.24	532,412.16
AC2	3,752,356.21	532,299.86
AC3	3,751,975.52	532,510.04
AC4	3,752,267.88	531,962.17
AC5	3,757,478.41	526,899.79
AC6	3,757,578.42	526,833.35
AC7	3,757,336.70	526,645.23
AC8	3,757,436.70	526,578.77
AC9	3,756,965.40	526,582.88
AC10	3,757,502.30	526,245.71

BREAKWATER ALIGNMENT COORDINATES

PT.	EASTING	NORTHING
1	3,751,719.15	535,364.74
2	3,751,270.05	534,572.14
3	3,751,475.15	533,565.62
4	3,751,759.81	532,607.09
5	3,752,243.39	531,699.67
6	3,752,795.29	530,812.00
7	3,753,195.71	529,966.29
8	3,753,527.36	529,370.90
9*	3,753,589.65	529,301.04
10*	3,753,702.73	529,114.12
11*	3,753,805.21	528,852.86
12*	3,753,927.74	528,495.43
13*	3,753,989.53	528,225.70
14*	3,754,442.02	527,733.49
15*	3,754,455.92	527,740.45
16*	3,754,600.20	527,761.71
17*	3,754,768.83	527,749.76
18*	3,754,873.73	527,725.16
19	3,755,297.92	527,580.04
20	3,755,773.24	527,369.79
21	3,756,271.99	526,911.79
22	3,756,865.77	526,477.30
23	3,757,711.11	525,940.18
24	3,758,325.51	525,484.75

* SHEET PILE STRUCTURE

NOTE:
ROCK BREAKWATERS SHALL BE CONSTRUCTED ACCORDING TO THE ALIGNMENT COORDINATES LISTED ON THIS SHEET.

REV.	DATE	DESCRIPTION	BY

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

DRAWN BY: SHANE FAUST
DESIGNED BY: SHANNON HAYNES, P.E.
APPROVED BY: LUKE LE BAS, P.E.

LAKE BORGNE SHORELINE PROTECTION
STATE PROJECT NUMBER: PO-30
FEDERAL PROJECT NUMBER: PO-30

BAYOU DUPRE ALIGNMENT
DATE: FEBRUARY 2007

LEGEND

- ROCK BREAKWATER
- SHEET PILE STRUCTURE
- SETTLEMENT PLATE
- WARNING SIGN
- TEMPORARY SPOIL
- ACCESS AND FLOTATION CHANNEL
- EXISTING USACE ROCK BREAKWATER
- BENCHMARK/MONUMENT
- EXISTING OYSTER LEASE

PERMANENT WARNING SIGNS

SIGN	EASTING	NORTHING
WS1	3,751,257.17	534,917.98
WS2	3,751,440.25	533,935.98
WS3	3,752,708.83	532,929.13
WS4	3,752,168.76	531,954.07
WS5	3,752,636.35	531,153.47
WS6	3,753,067.92	530,315.52
WS7	3,753,551.97	529,388.24
WS8	3,753,905.80	528,739.93
WS9	3,755,515.79	527,886.39
WS10	3,755,136.24	527,669.87
WS11	3,755,882.51	527,306.63
WS12	3,756,663.40	526,659.12
WS13	3,757,512.73	526,098.17
WS14	3,758,256.29	525,570.17

SETTLEMENT PLATES

PLATE	EASTING	NORTHING
SP1	3,751,179.14	535,364.73
SP2	3,751,310.53	534,373.40
SP3	3,751,525.27	533,396.73
SP4	3,751,844.10	532,448.92
SP5	3,752,323.26	531,571.19
SP6	3,752,840.92	530,715.61
SP7	3,753,279.04	529,816.69
SP8	3,755,345.33	527,559.06
SP9	3,756,167.36	527,007.86
SP10	3,756,966.07	526,406.88
SP11	3,757,805.31	525,863.19

ESTIMATED MATERIALS QUANTITIES REACHES 1 AND 2

MATERIAL	QUANTITY	UNITS
ROCK (INTIAL BREAKWATER LIFT)	78,834	TONS
ROCK (SECONDARY BREAKWATER LIFT)	6,687	TONS
ACCESS & FLOTATION CHANNELS	109,559 (ESTIMATED)	CUBIC YARDS
GEOGRID COMPOSITE	33,478	SQUARE YARDS
STEEL SHEETPILE	112,546	SQUARE FEET
GALVANIZED STEEL TUBE WALERS	3,242	EACH
GALVANIZED STEEL WALER SPLICE	203	EACH
TIE ROD ASSEMBLIES	203	EACH
SAND FILL	4,650	CUBIC YARDS
SETTLEMENT PLATES	11	EACH
PERMANENT WARNING SIGNS	14	EACH

LAKE BORGNE

EXISTING OYSTER LEASE (TYP.)

FLOTATION CHANNEL (TYP.)

WARNING SIGN (TYP.) SEE DETAIL B ON SHEET 28

TEMPORARY SPOIL STOCKPILE (TYP.)

ROCK BREAKWATER (TYP.)

SP1 SP2 SP3 SP4 SP5 SP6 SP7

WS1 WS2 WS3 WS4 WS5 WS6 WS7 WS8 WS9 WS10 WS11 WS12 WS13 SP11 WS14

SP8 SP9 SP10

1000' 500' 0' 1000' 2000'

BACK-TO-BACK STEEL SHEET PILE STRUCTURE

EXISTING USACE ROCK BREAKWATER (TYP.)

BAYOU DUPRE'

MARTELLO'S CASTLE

ACCESS CHANNEL (TYP.)

SEE NOTE 5 ON SHEET 26 (TYP.)

SETTLEMENT PLATE (TYP.) SEE DETAIL A ON SHEET 28

BACK-TO-BACK STEEL SHEET PILE STRUCTURE

CULTURAL SITE SB39

CULTURAL SITE SB154

PO-30-SM-01

MISSISSIPPI RIVER GULF OUTLET

STATE OF LOUISIANA
SHANNON McCLAIN HAYNES
License No. 30552
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

NOTES:

1. DEPENDING ON DRAFT REQUIREMENTS OF THE CONTRACTOR'S EQUIPMENT, ACCESS AND FLOTATION CHANNELS MAY NOT BE REQUIRED AT ALL LOCATIONS SHOWN. FLOTATION CHANNELS ARE PERMITTED TO A MAXIMUM DEPTH OF -6.0' NAVD 88. IT IS NOT MANDATORY THAT THE CONTRACTOR DREDGE TO THIS DEPTH.
2. THE CONTRACTOR SHALL TEMPORARILY DISPOSE OF FLOTATION SPOIL IN THE AREAS SHOWN ON THE PLANS. THE SPOIL SHALL BE BACKFILLED INTO THE CHANNELS PRIOR TO DEMOBILIZATION IN ACCORDANCE WITH THE SPECIFICATIONS.
3. SETTLEMENT PLATES ARE LOCATED AT 1000' INTERVALS ALONG THE CENTERLINE OF THE ROCK BREAKWATER.
4. WARNING SIGNS ARE LOCATED AT 1000' INTERVALS 50' OFFSHORE OF THE CENTERLINE OF THE ROCK BREAKWATER.
5. CONSTRUCTION ACTIVITIES SHALL AVOID DISTURBING ALL CULTURAL RESOURCE SITES.
6. SEE SPECIFICATIONS FOR OYSTER RESTRICTIONS.

REV.	DATE	DESCRIPTION	BY

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

DRAWN BY: SHANE FAUST | DESIGNED BY: SHANNON HAYNES, P.E. | APPROVED BY: LUKE LE BAS, P.E.

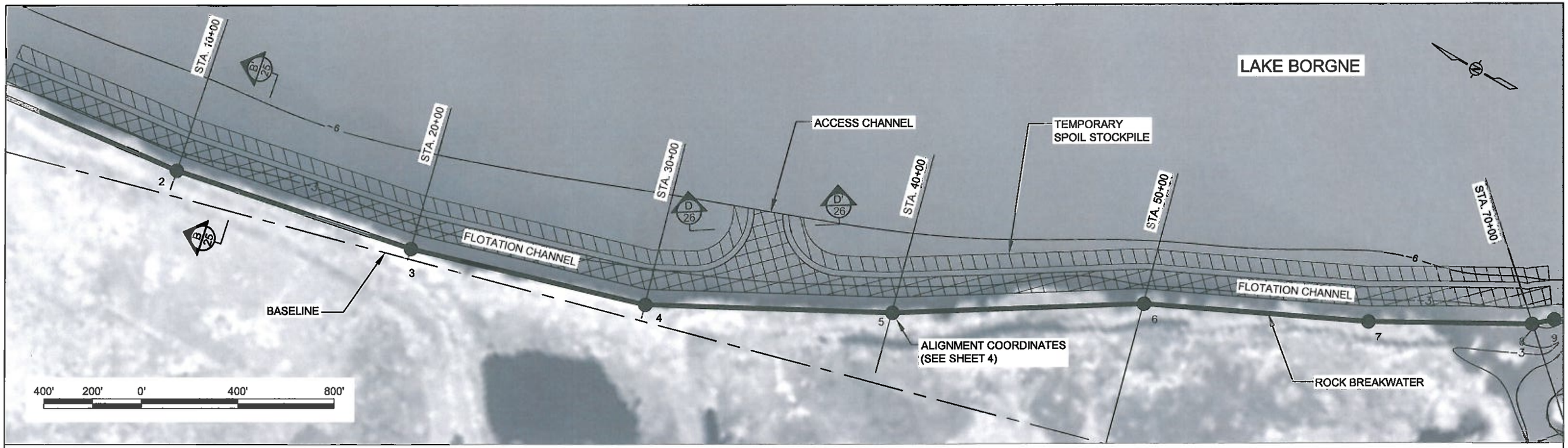
LAKE BORGNE SHORELINE PROTECTION

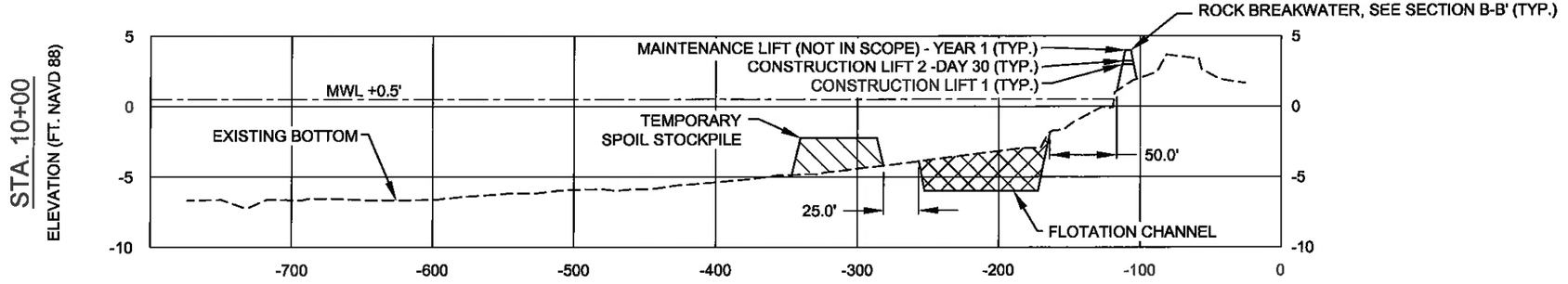
STATE PROJECT NUMBER: PO-30

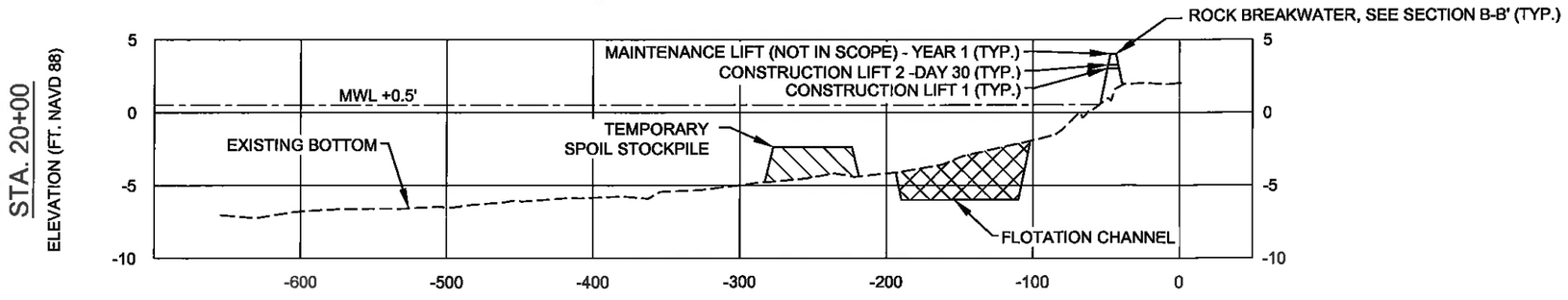
FEDERAL PROJECT NUMBER: PO-30

BAYOU DUPRE PROJECT LAYOUT

DATE: FEBRUARY 2007







STATE OF LOUISIANA
SHANNON McCLAIN HAYNES
License No. 30552
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
2/14/07

LEGEND
- EXISTING BOTTOM
- TEMPORARY SPOIL
- ACCESS & FLOTATION CHANNEL

HORIZONTAL GRAPHIC SCALE
100' 50' 0 100' 200'
10' 5' 0 10' 20'
VERTICAL GRAPHIC SCALE

REV.	DATE	DESCRIPTION	BY

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

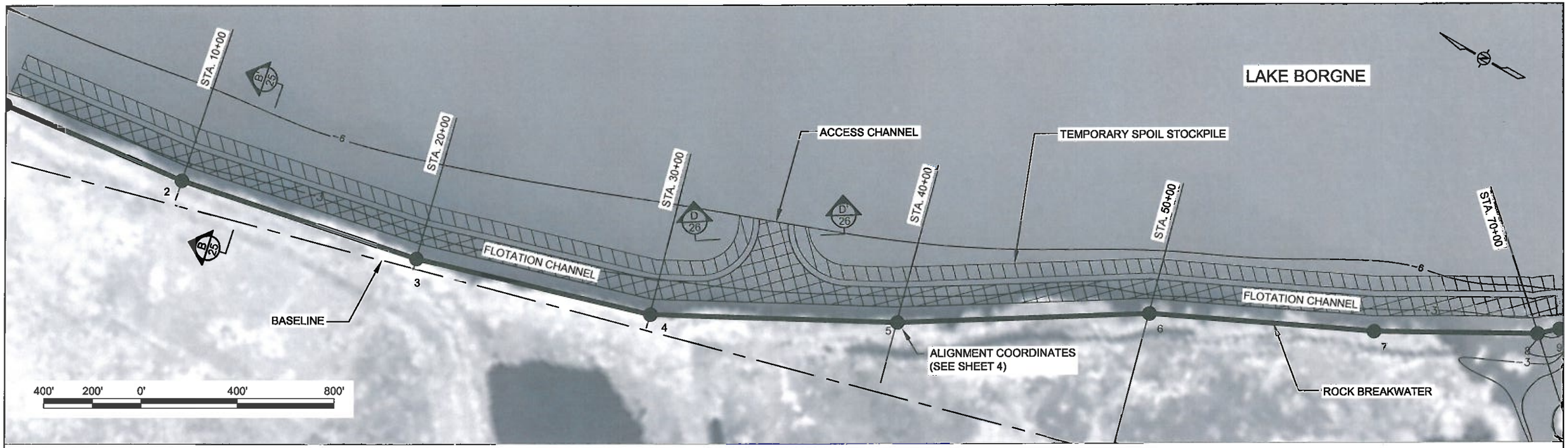
DRAWN BY: SHANE FAUST
DESIGNED BY: SHANNON HAYNES, P.E.
APPROVED BY: LUKE LE BAS, P.E.

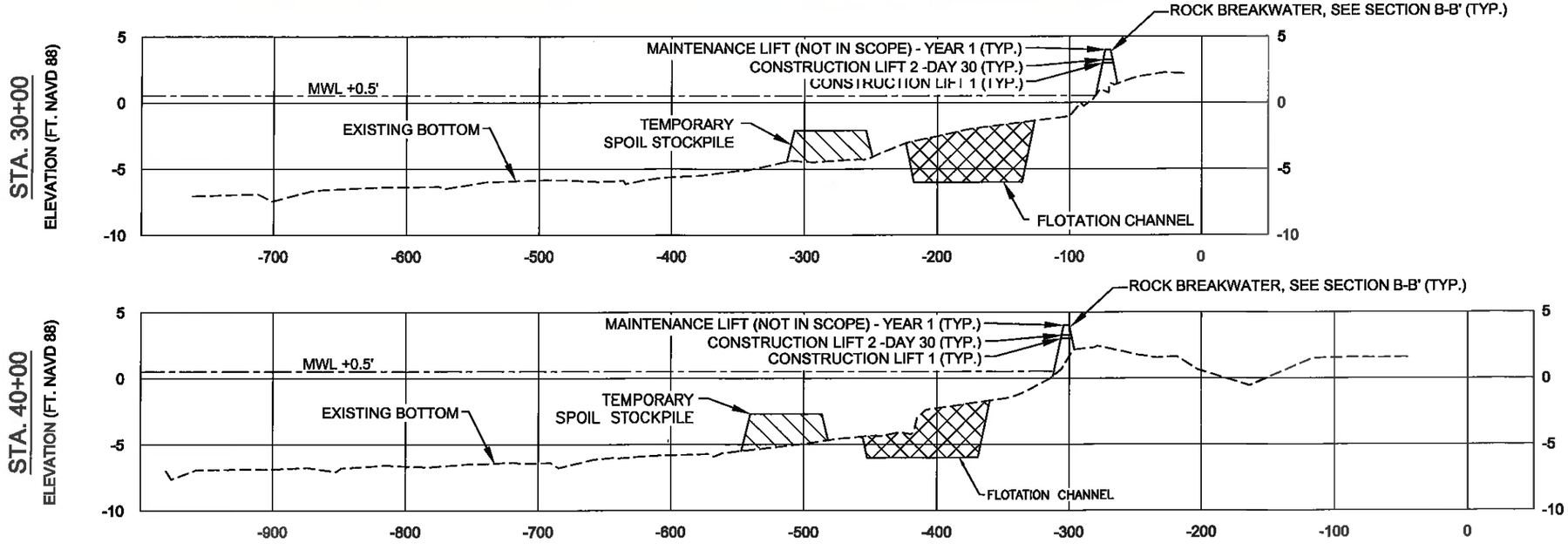
LAKE BORGNE
SHORELINE PROTECTION

STATE PROJECT NUMBER: PO-30
FEDERAL PROJECT NUMBER: PO-30

BAYOU DUPRE - REACH 1
PLAN & SECTION VIEWS

DATE: FEBRUARY 2007
SHEET 6 OF 34





STATE OF LOUISIANA
SHANNON McCLAIN HAYNES
License No. 30552
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
2/7/07

LEGEND

- EXISTING BOTTOM
- TEMPORARY SPOIL
- ACCESS & FLOTATION CHANNEL

HORIZONTAL GRAPHIC SCALE
100' 50' 0 100' 200'
VERTICAL GRAPHIC SCALE
10' 5' 0 10' 20'

REV.	DATE	DESCRIPTION	BY

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

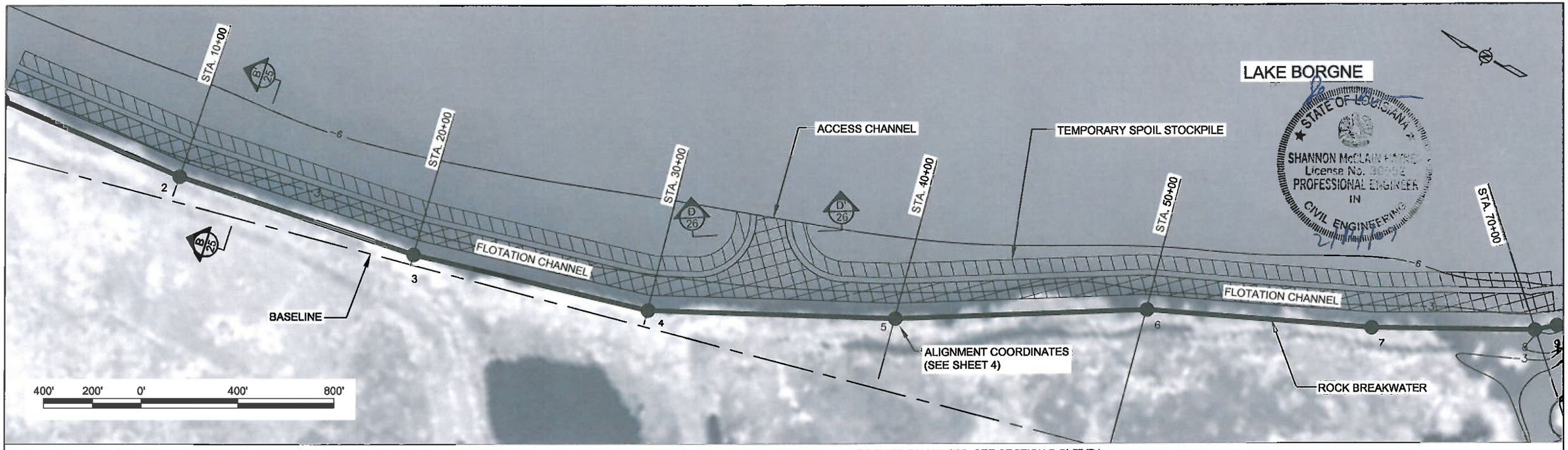
DRAWN BY: SHANE FAUST | DESIGNED BY: SHANNON HAYNES, P.E. | APPROVED BY: LUKE LE BAS, P.E.

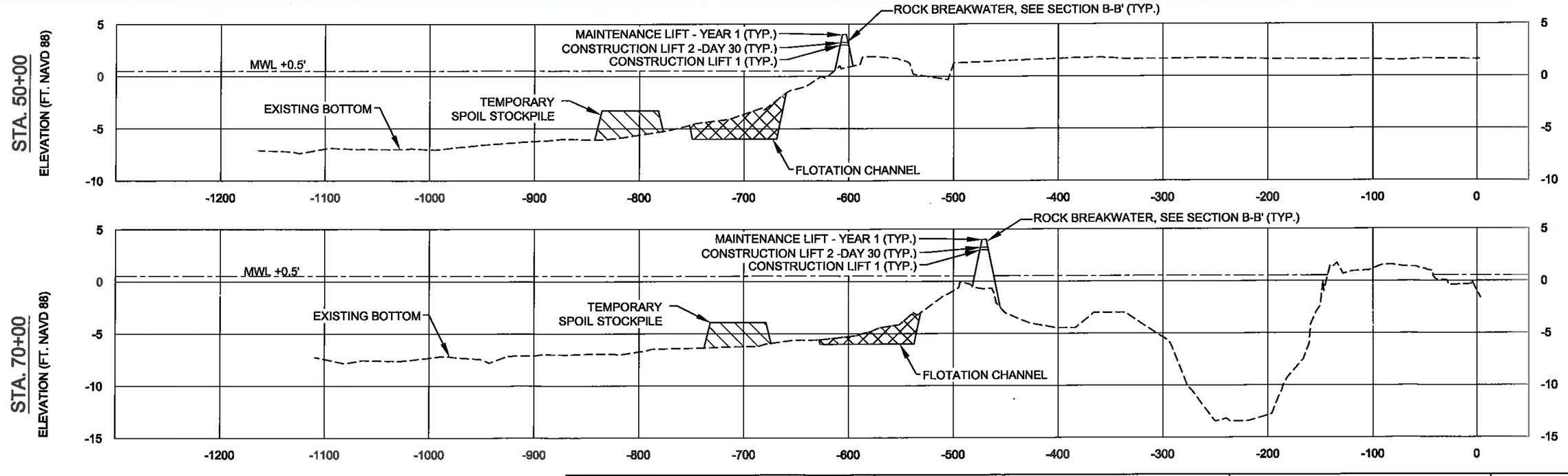
LAKE BORGNE
SHORELINE PROTECTION

STATE PROJECT NUMBER: PO-30
FEDERAL PROJECT NUMBER: PO-30

BAYOU DUPRE - REACH 1
PLAN & SECTION VIEWS

DATE: FEBRUARY 2007
SHEET 7 OF 34





LEGEND

- EXISTING BOTTOM
- TEMPORARY SPOIL
- ACCESS & FLOTATION CHANNEL

HORIZONTAL GRAPHIC SCALE
100' 50' 0 100' 200'
10' 5' 0 10' 20'
VERTICAL GRAPHIC SCALE

REV.	DATE	DESCRIPTION	BY

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

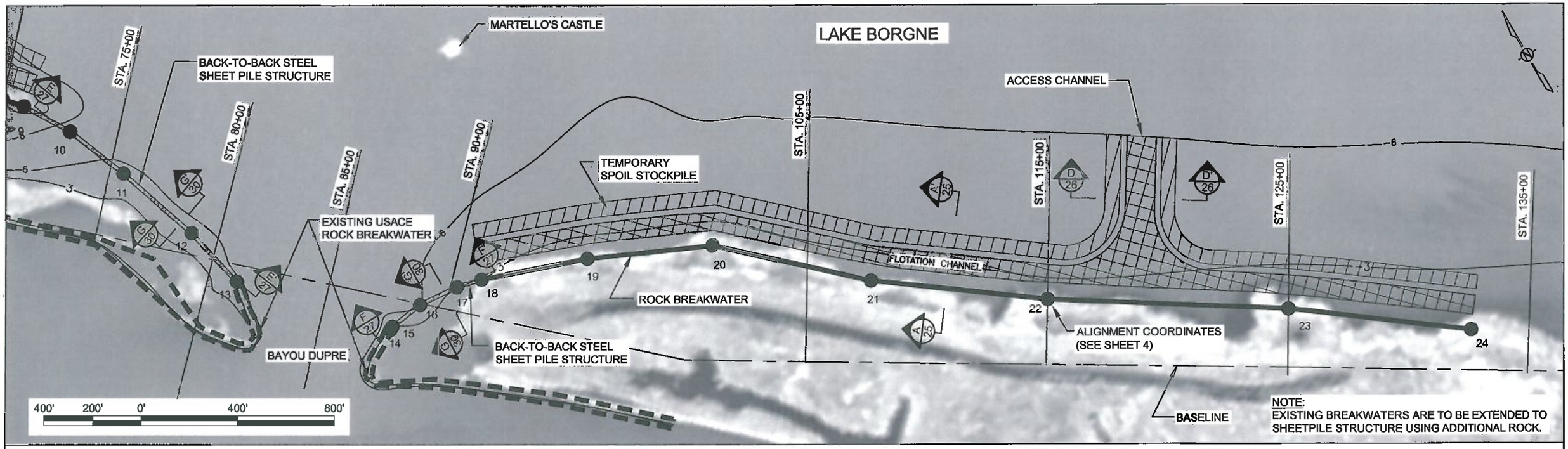
DRAWN BY: SHANE FAUST
DESIGNED BY: SHANNON HAYNES, P.E.
APPROVED BY: LUKE LE BAS, P.E.

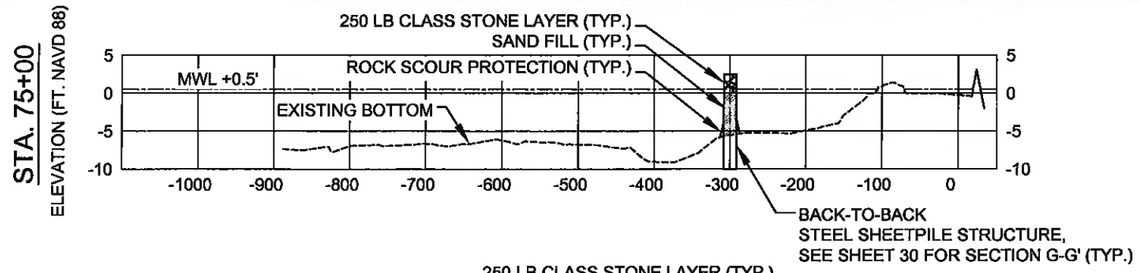
LAKE BORGNE
SHORELINE PROTECTION

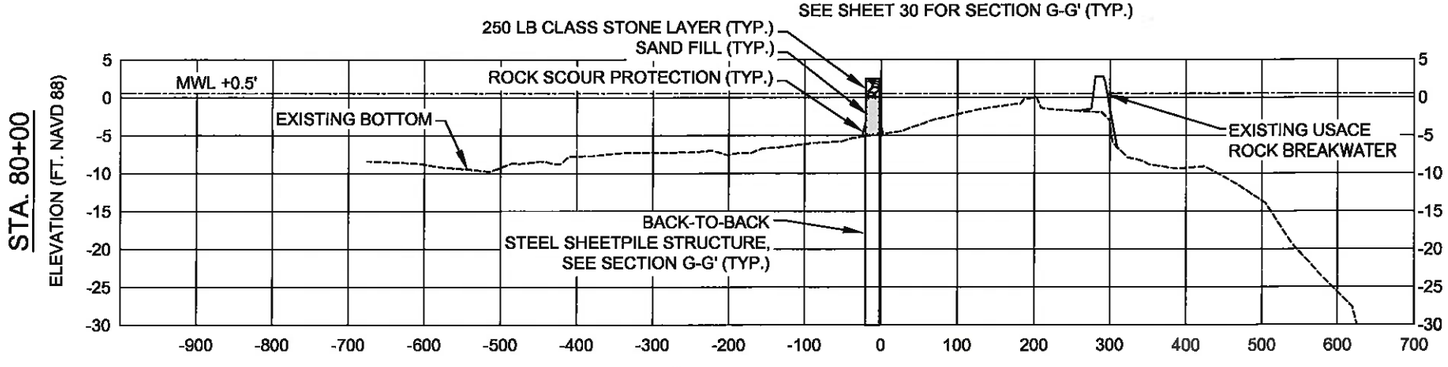
STATE PROJECT NUMBER: PO-30
FEDERAL PROJECT NUMBER: PO-30

BAYOU DUPRE - REACH 1
PLAN & SECTION VIEWS

DATE: FEBRUARY 2007
SHEET 8 OF 34







STATE OF LOUISIANA
SHANNON McCLAIN HAYNES
License No. 30552
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
2/9/07

LEGEND

- EXISTING BOTTOM
- 250 LB CLASS STONE
- SAND FILL
- TEMPORARY SPOIL
- ACCESS AND FLOTATION CHANNEL

HORIZONTAL GRAPHIC SCALE
200' 100' 0 200' 400'
VERTICAL GRAPHIC SCALE
20' 10' 0 20' 40'

REV.	DATE	DESCRIPTION	BY

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

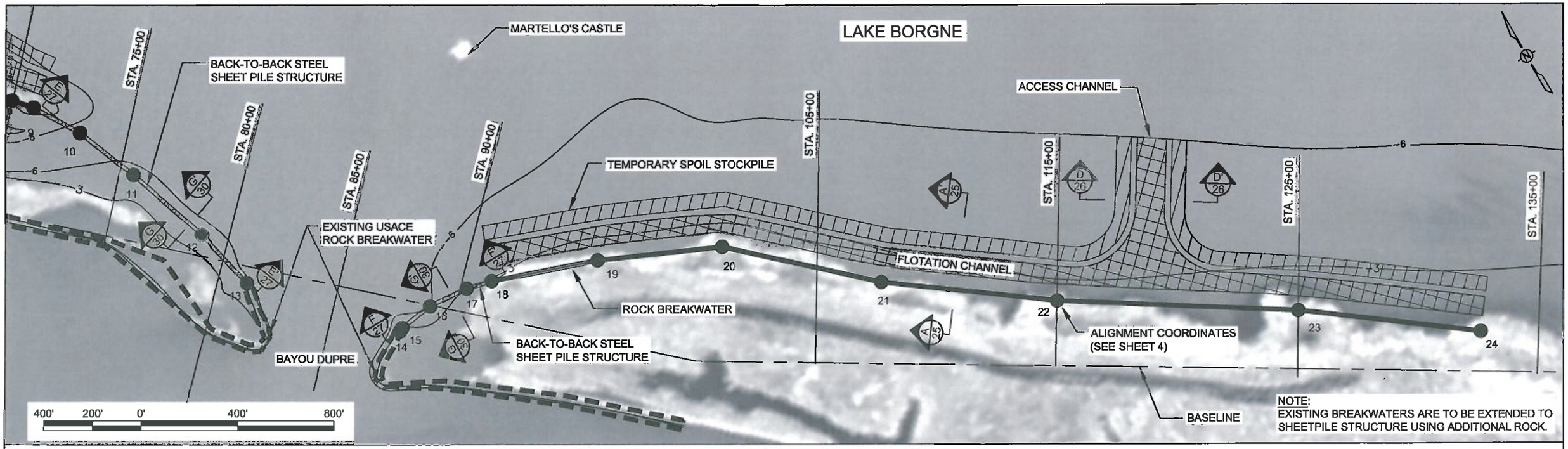
DRAWN BY: SHANE FAUST | DESIGNED BY: SHANNON HAYNES, P.E.

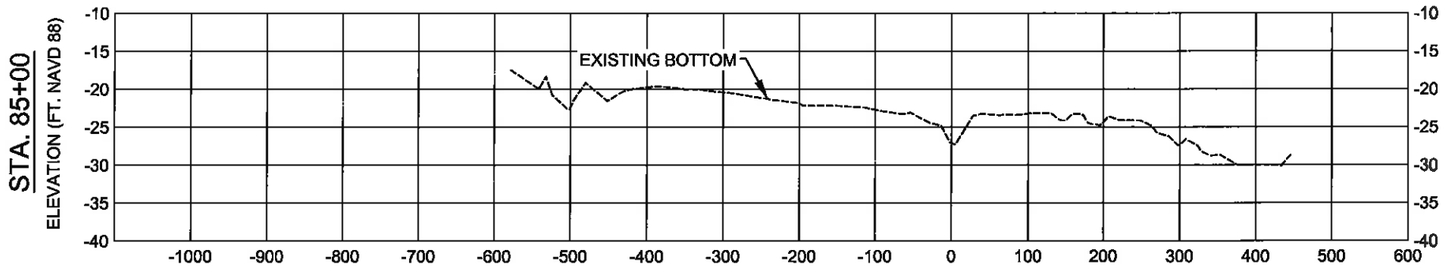
LAKE BORGNE SHORELINE PROTECTION

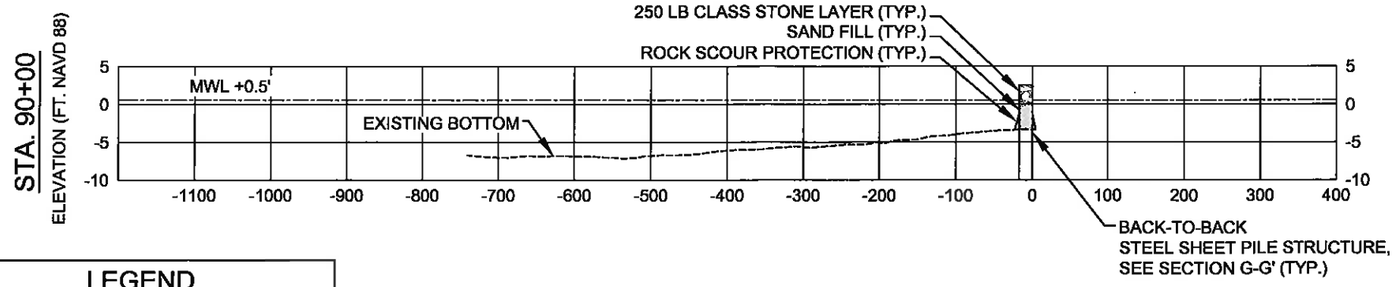
STATE PROJECT NUMBER: PO-30
FEDERAL PROJECT NUMBER: PO-30
APPROVED BY: LUKE LE BAS, P.E.

BAYOU DUPRE - REACH 1
PLAN & SECTION VIEWS

DATE: FEBRUARY 2007
SHEET 9 OF 34







STATE OF LOUISIANA
SHANNON McCLAIN HAYNES
License No. 30552
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

LEGEND

- EXISTING BOTTOM
- 250 LB CLASS STONE
- SAND FILL
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- ACCESS AND FLOTATION CHANNEL

HORIZONTAL GRAPHIC SCALE
200' 100' 0 200' 400'
20' 10' 0 20' 40'
VERTICAL GRAPHIC SCALE

REV.	DATE	DESCRIPTION	BY

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
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BATON ROUGE, LOUISIANA 70802

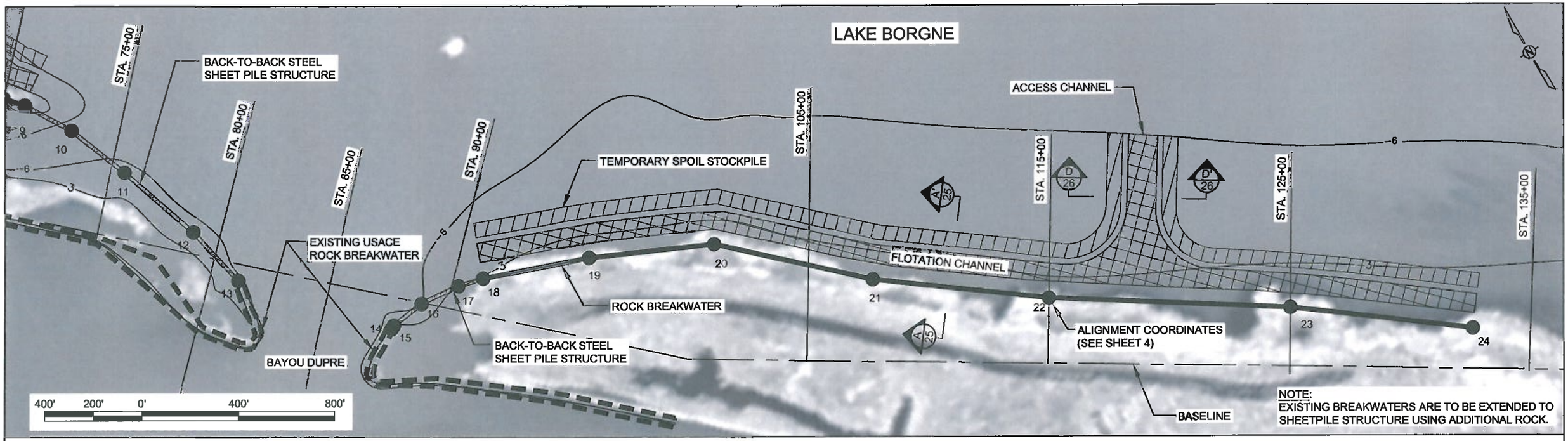
DRAWN BY: SHANE FAUST
DESIGNED BY: SHANNON HAYNES, P.E.
APPROVED BY: LUKE LE BAS, P.E.

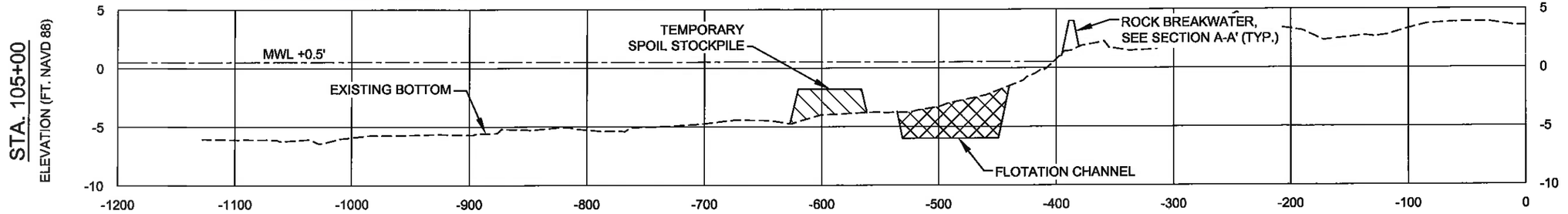
LAKE BORGNE
SHORELINE PROTECTION

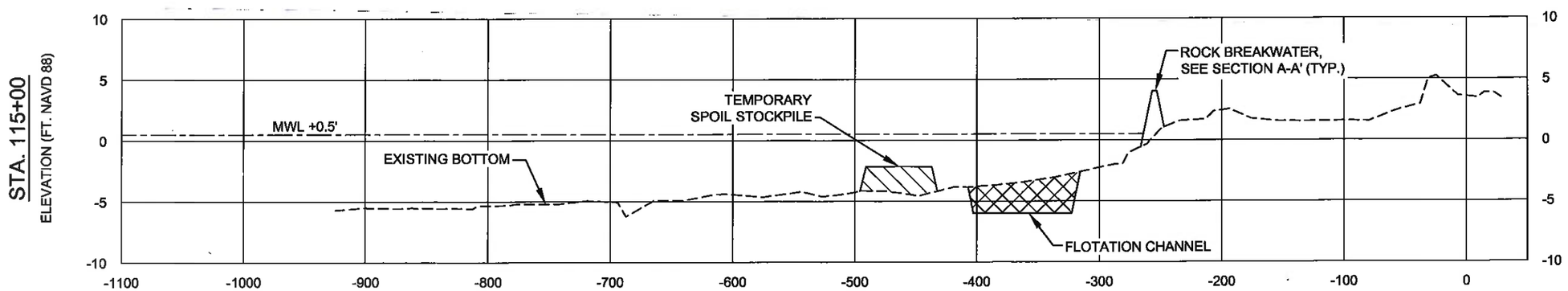
STATE PROJECT NUMBER: PO-30
FEDERAL PROJECT NUMBER: PO-30

BAYOU DUPRE - REACH 2
PLAN & SECTION VIEWS

DATE: FEBRUARY 2007
SHEET 10 OF 34







LEGEND
- EXISTING BOTTOM
- TEMPORARY SPOIL
- ACCESS AND FLOTATION CHANNEL

HORIZONTAL GRAPHIC SCALE
100' 500' 0 100' 200'
VERTICAL GRAPHIC SCALE
10' 5' 0 10' 20'

REV.	DATE	DESCRIPTION	BY

STATE OF LOUISIANA
SHANNON McCLAIN HAYNES
License No. 30552
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
2/14/07

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

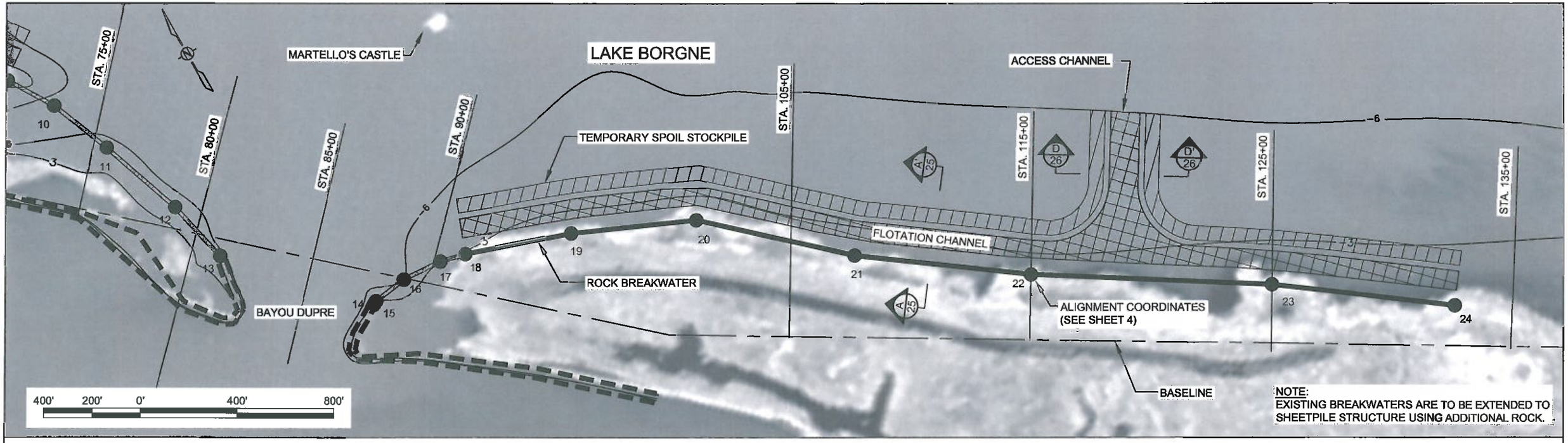
DRAWN BY: SHANE FAUST
DESIGNED BY: SHANNON HAYNES, P.E.
APPROVED BY: LUKE LE BAS, P.E.

LAKE BORGNE
SHORELINE PROTECTION

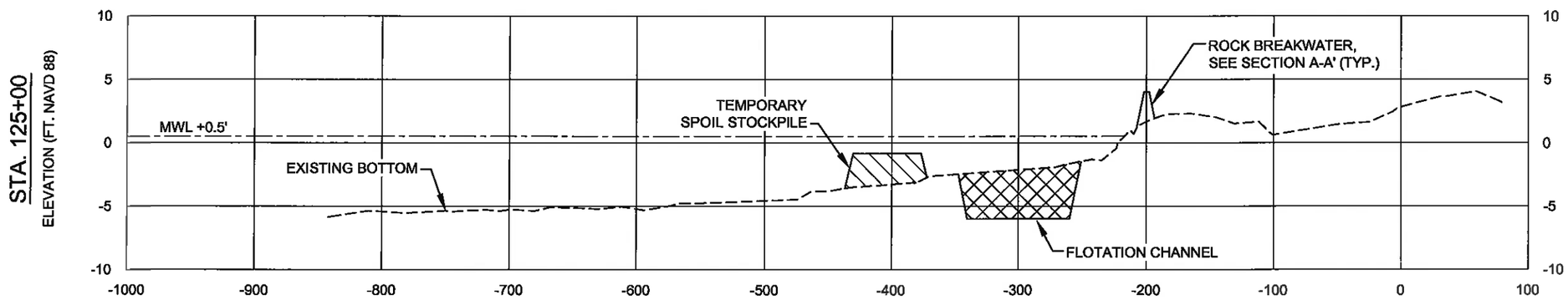
STATE PROJECT NUMBER: PO-30
FEDERAL PROJECT NUMBER: PO-30

BAYOU DUPRE - REACH 2
PLAN & SECTION VIEWS

DATE: FEBRUARY 2007
SHEET 11 OF 34



NOTE:
EXISTING BREAKWATERS ARE TO BE EXTENDED TO SHEETPILE STRUCTURE USING ADDITIONAL ROCK.



STATE OF LOUISIANA
SHANNON McCLAIN HAYNES
License No. 30552
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
2/14/07

LEGEND

- EXISTING BOTTOM
- TEMPORARY SPOIL
- ACCESS AND FLOTATION CHANNEL

HORIZONTAL GRAPHIC SCALE
100' 50' 0 100' 200'
10' 5' 0 10' 20'
VERTICAL GRAPHIC SCALE

REV.	DATE	DESCRIPTION	BY

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

DRAWN BY: SHANE FAUST
DESIGNED BY: SHANNON HAYNES, P.E.
APPROVED BY: LUKE LE BAS, P.E.

LAKE BORGNE
SHORELINE PROTECTION
STATE PROJECT NUMBER: PO-30
FEDERAL PROJECT NUMBER: PO-30

BAYOU DUPRE - REACH 2
PLAN & SECTION VIEWS
DATE: FEBRUARY 2007
SHEET 12 OF 34

STATE OF LOUISIANA
SHANNON McCLAIN HAYNES
License No. 36082
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

EXISTING SOIL BORINGS

PLATE	EASTING	NORTHING
B6	3,798,852.04	502,450.83
B7	3,804,243.86	500,695.54
B8	3,805,937.64	500,537.13
B9	3,807,533.97	500,967.39
B10	3,809,986.61	499,912.97
B11	3,812,670.44	499,016.67
B17	3,799,987.57	501,854.83
B18	3,802,221.82	501,150.37
B19	3,803,030.36	501,011.45
B20	3,803,821.21	500,879.38
B21	3,804,936.13	500,683.30
B22	3,809,391.79	499,641.64
B23	3,810,780.69	499,260.81
B24	3,811,671.66	499,151.58

NOTES:
1. MONUMENT DATA SHEETS ARE INCLUDED IN THE SPECIFICATIONS.
2. TEMPORARY BENCHMARKS MAY EXIST OR REQUIRE REPLACEMENT BY CONTRACTOR.
3. BORING LOGS ARE INCLUDED IN THE SPECIFICATIONS.

REV.	DATE	DESCRIPTION	BY

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

DRAWN BY: SHANE FAUST | DESIGNED BY: SHANNON HAYNES, P.E.

LAKE BORGNE
SHORELINE PROTECTION

STATE PROJECT NUMBER: PO-30
FEDERAL PROJECT NUMBER: PO-30
APPROVED BY: LUKE LE BAS, P.E.

SHELL BEACH SURVEY
& SOIL BORINGS LAYOUT

DATE: FEBRUARY 2007
SHEET 13 OF 34

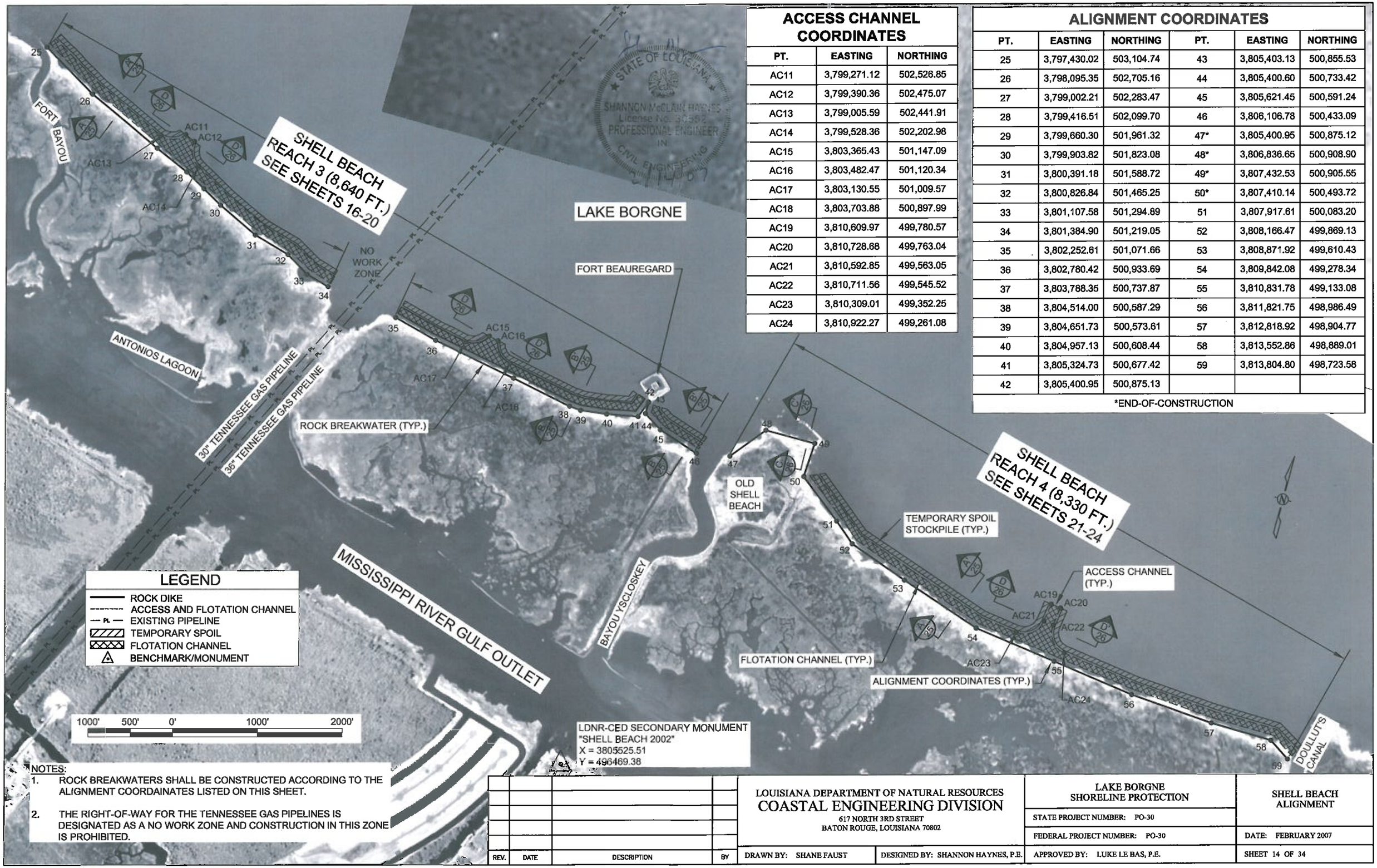
ACCESS CHANNEL COORDINATES

PT.	EASTING	NORTHING
AC11	3,799,271.12	502,526.85
AC12	3,799,390.36	502,475.07
AC13	3,799,005.59	502,441.91
AC14	3,799,528.36	502,202.98
AC15	3,803,365.43	501,147.09
AC16	3,803,482.47	501,120.34
AC17	3,803,130.55	501,009.57
AC18	3,803,703.88	500,897.99
AC19	3,810,609.97	499,780.57
AC20	3,810,728.68	499,763.04
AC21	3,810,592.85	499,563.05
AC22	3,810,711.56	499,545.52
AC23	3,810,309.01	499,352.25
AC24	3,810,922.27	499,261.08

ALIGNMENT COORDINATES

PT.	EASTING	NORTHING	PT.	EASTING	NORTHING
25	3,797,430.02	503,104.74	43	3,805,403.13	500,855.53
26	3,798,095.35	502,705.16	44	3,805,400.60	500,733.42
27	3,799,002.21	502,283.47	45	3,805,621.45	500,591.24
28	3,799,416.51	502,099.70	46	3,806,106.78	500,433.09
29	3,799,660.30	501,961.32	47*	3,805,400.95	500,875.12
30	3,799,903.82	501,823.08	48*	3,806,836.65	500,908.90
31	3,800,391.18	501,588.72	49*	3,807,432.53	500,905.55
32	3,800,826.84	501,465.25	50*	3,807,410.14	500,493.72
33	3,801,107.58	501,294.89	51	3,807,917.61	500,083.20
34	3,801,384.90	501,219.05	52	3,808,166.47	499,869.13
35	3,802,252.61	501,071.66	53	3,808,871.92	499,610.43
36	3,802,780.42	500,933.69	54	3,809,842.08	499,278.34
37	3,803,788.35	500,737.87	55	3,810,831.78	499,133.08
38	3,804,514.00	500,587.29	56	3,811,821.75	498,986.49
39	3,804,651.73	500,573.61	57	3,812,818.92	498,904.77
40	3,804,957.13	500,608.44	58	3,813,552.86	498,889.01
41	3,805,324.73	500,677.42	59	3,813,804.80	498,723.58
42	3,805,400.95	500,875.13			

*END-OF-CONSTRUCTION



NOTES:

1. ROCK BREAKWATERS SHALL BE CONSTRUCTED ACCORDING TO THE ALIGNMENT COORDAINATES LISTED ON THIS SHEET.
2. THE RIGHT-OF-WAY FOR THE TENNESSEE GAS PIPELINES IS DESIGNATED AS A NO WORK ZONE AND CONSTRUCTION IN THIS ZONE IS PROHIBITED.

REV.	DATE	DESCRIPTION	BY

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

DRAWN BY: SHANE FAUST | DESIGNED BY: SHANNON HAYNES, P.E.

LAKE BORGNE SHORELINE PROTECTION

STATE PROJECT NUMBER: PO-30

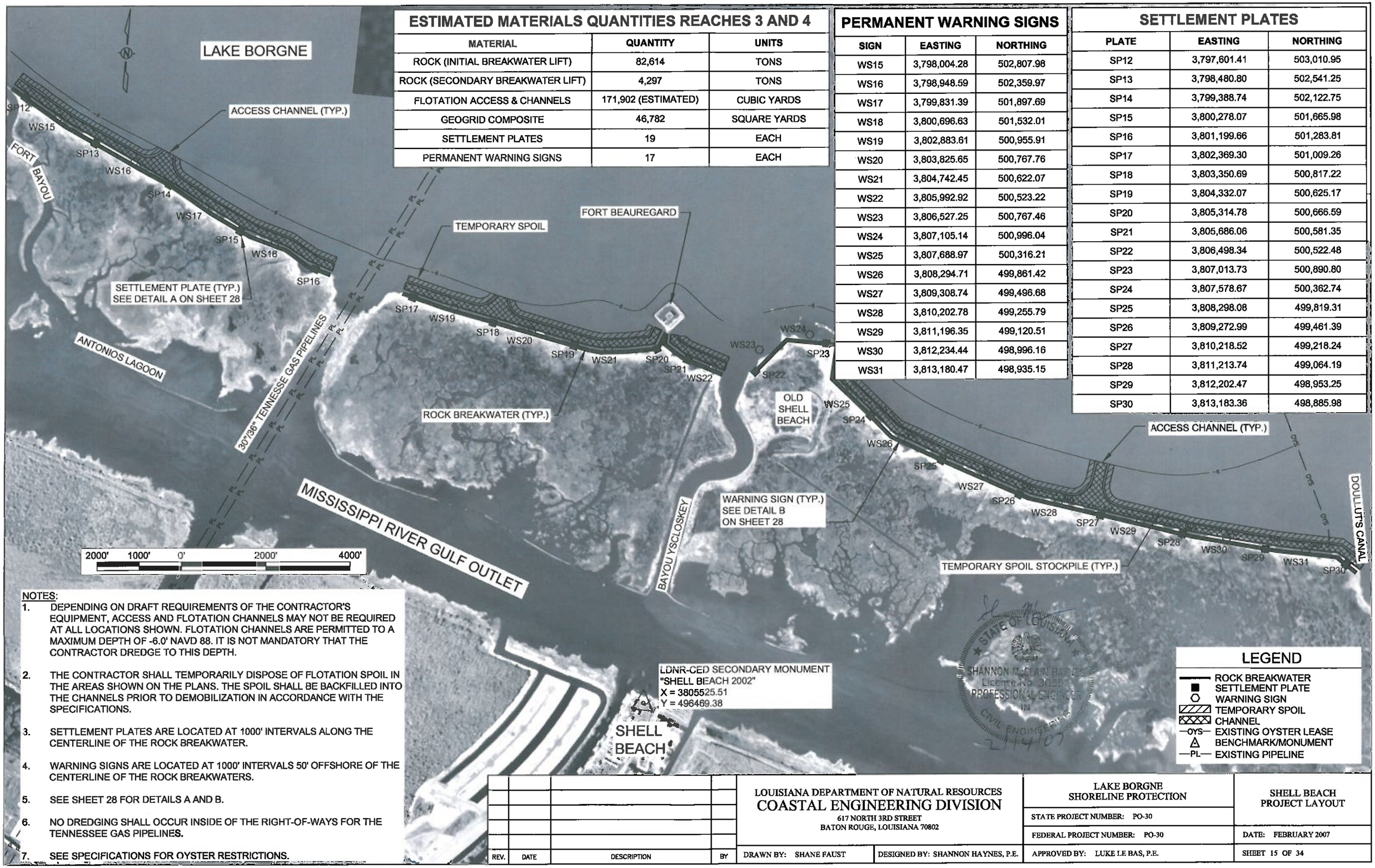
FEDERAL PROJECT NUMBER: PO-30

APPROVED BY: LUKE LE BAS, P.E.

SHELL BEACH ALIGNMENT

DATE: FEBRUARY 2007

SHEET 14 OF 34



ESTIMATED MATERIALS QUANTITIES REACHES 3 AND 4

MATERIAL	QUANTITY	UNITS
ROCK (INITIAL BREAKWATER LIFT)	82,614	TONS
ROCK (SECONDARY BREAKWATER LIFT)	4,297	TONS
FLOTATION ACCESS & CHANNELS	171,902 (ESTIMATED)	CUBIC YARDS
GEOGRID COMPOSITE	46,782	SQUARE YARDS
SETTLEMENT PLATES	19	EACH
PERMANENT WARNING SIGNS	17	EACH

PERMANENT WARNING SIGNS

SIGN	EASTING	NORTHING
WS15	3,798,004.28	502,807.98
WS16	3,798,948.59	502,359.97
WS17	3,799,831.39	501,897.69
WS18	3,800,696.63	501,532.01
WS19	3,802,883.61	500,955.91
WS20	3,803,825.65	500,767.76
WS21	3,804,742.45	500,622.07
WS22	3,805,992.92	500,523.22
WS23	3,806,527.25	500,767.46
WS24	3,807,105.14	500,996.04
WS25	3,807,688.97	500,316.21
WS26	3,808,294.71	499,861.42
WS27	3,809,308.74	499,496.68
WS28	3,810,202.78	499,255.79
WS29	3,811,196.35	499,120.51
WS30	3,812,234.44	498,996.16
WS31	3,813,180.47	498,935.15

SETTLEMENT PLATES

PLATE	EASTING	NORTHING
SP12	3,797,601.41	503,010.95
SP13	3,798,480.80	502,541.25
SP14	3,799,388.74	502,122.75
SP15	3,800,278.07	501,665.98
SP16	3,801,199.66	501,283.81
SP17	3,802,369.30	501,009.26
SP18	3,803,350.69	500,817.22
SP19	3,804,332.07	500,625.17
SP20	3,805,314.78	500,666.59
SP21	3,805,686.06	500,581.35
SP22	3,806,498.34	500,522.48
SP23	3,807,013.73	500,890.80
SP24	3,807,578.67	500,362.74
SP25	3,808,298.08	499,819.31
SP26	3,809,272.99	499,461.39
SP27	3,810,218.52	499,218.24
SP28	3,811,213.74	499,064.19
SP29	3,812,202.47	498,953.25
SP30	3,813,183.36	498,885.98

NOTES:

1. DEPENDING ON DRAFT REQUIREMENTS OF THE CONTRACTOR'S EQUIPMENT, ACCESS AND FLOTATION CHANNELS MAY NOT BE REQUIRED AT ALL LOCATIONS SHOWN. FLOTATION CHANNELS ARE PERMITTED TO A MAXIMUM DEPTH OF -6.0' NAVD 88. IT IS NOT MANDATORY THAT THE CONTRACTOR DREDGE TO THIS DEPTH.
2. THE CONTRACTOR SHALL TEMPORARILY DISPOSE OF FLOTATION SPOIL IN THE AREAS SHOWN ON THE PLANS. THE SPOIL SHALL BE BACKFILLED INTO THE CHANNELS PRIOR TO DEMOBILIZATION IN ACCORDANCE WITH THE SPECIFICATIONS.
3. SETTLEMENT PLATES ARE LOCATED AT 1000' INTERVALS ALONG THE CENTERLINE OF THE ROCK BREAKWATER.
4. WARNING SIGNS ARE LOCATED AT 1000' INTERVALS 50' OFFSHORE OF THE CENTERLINE OF THE ROCK BREAKWATERS.
5. SEE SHEET 28 FOR DETAILS A AND B.
6. NO DREDGING SHALL OCCUR INSIDE OF THE RIGHT-OF-WAYS FOR THE TENNESSEE GAS PIPELINES.
7. SEE SPECIFICATIONS FOR OYSTER RESTRICTIONS.

REV.	DATE	DESCRIPTION	BY

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

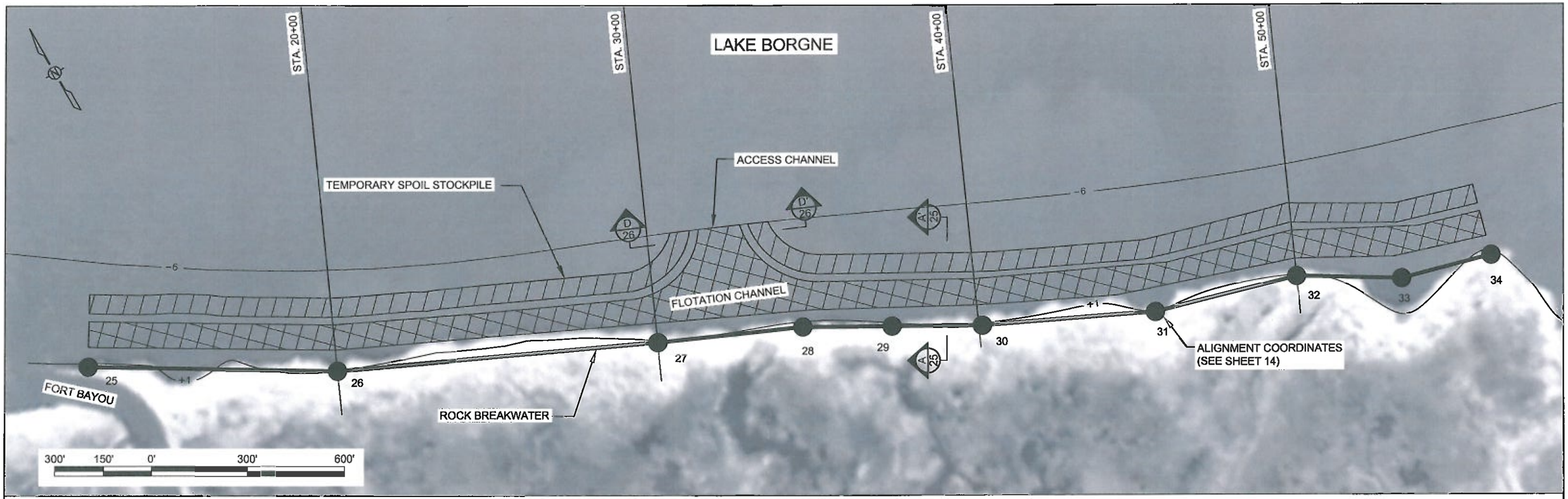
DRAWN BY: SHANE FAUST
DESIGNED BY: SHANNON HAYNES, P.E.
APPROVED BY: LUKE LE BAS, P.E.

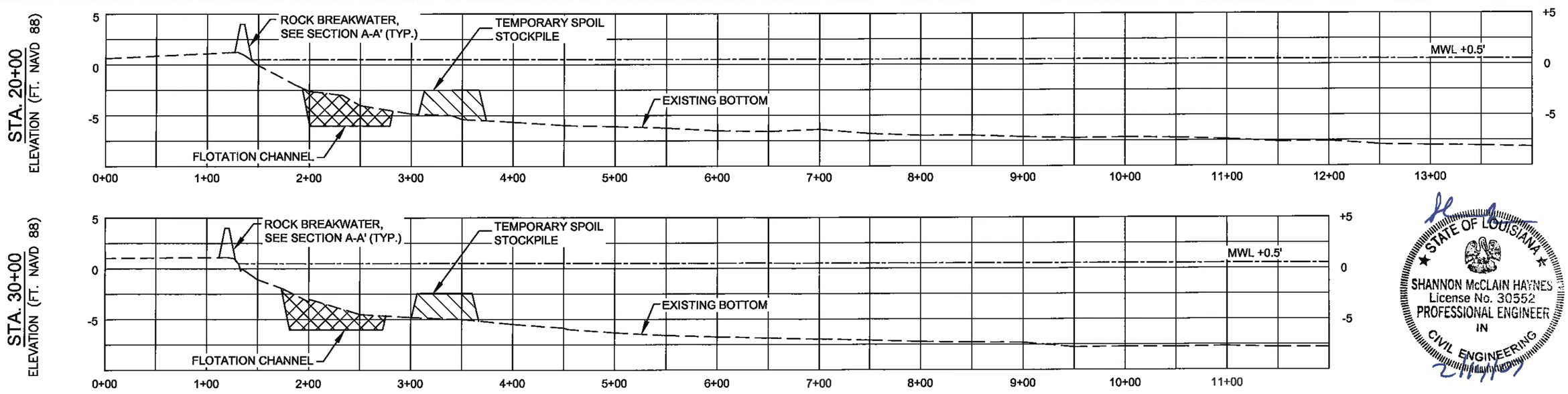
LAKE BORGNE
SHORELINE PROTECTION

STATE PROJECT NUMBER: PO-30
FEDERAL PROJECT NUMBER: PO-30

SHELL BEACH
PROJECT LAYOUT

DATE: FEBRUARY 2007
SHEET 15 OF 34





STATE OF LOUISIANA
SHANNON McCLAIN HAYNES
License No. 30552
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

LEGEND

- EXISTING BOTTOM
- TEMPORARY SPOIL
- ACCESS AND FLOTATION CHANNEL

HORIZONTAL GRAPHIC SCALE
100' 50' 0 100' 200'
10' 5' 0 10' 20'
VERTICAL GRAPHIC SCALE

REV.	DATE	DESCRIPTION	BY

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

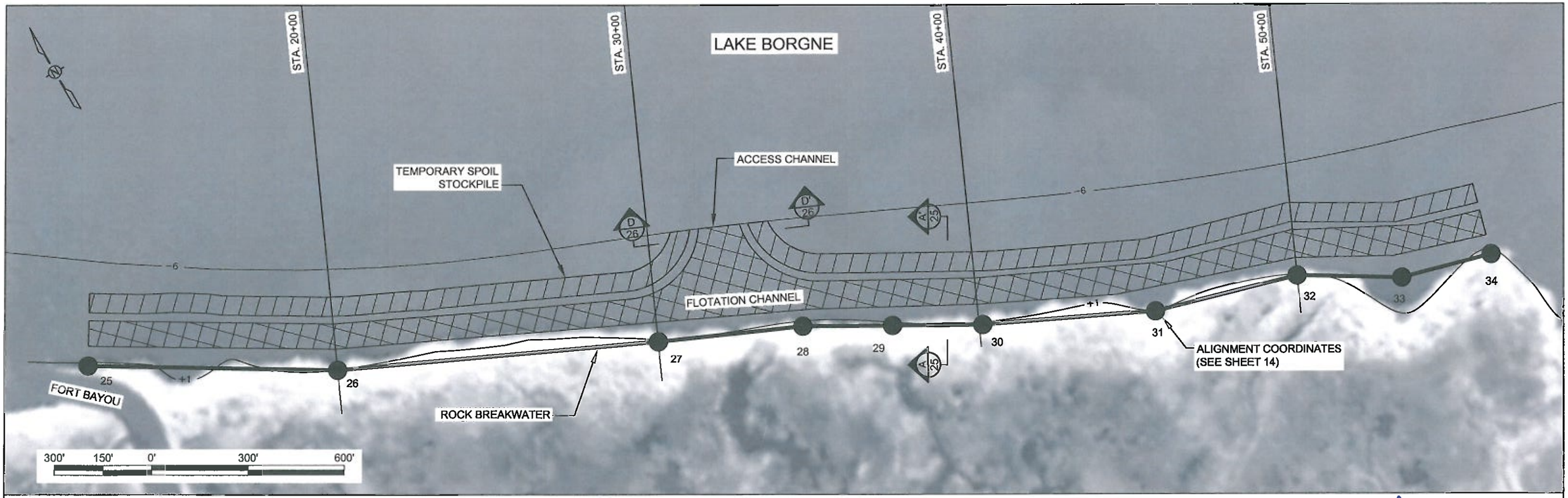
DRAWN BY: SHANE FAUST
DESIGNED BY: SHANNON HAYNES, P.E.
APPROVED BY: LUKE LE BAS, P.E.

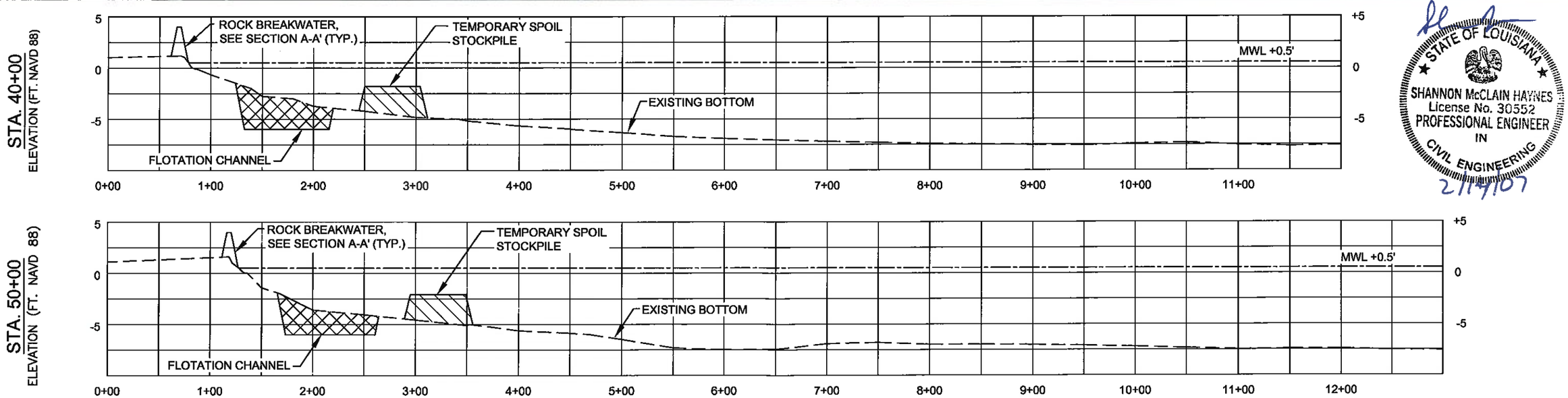
LAKE BORGNE
SHORELINE PROTECTION

STATE PROJECT NUMBER: PO-30
FEDERAL PROJECT NUMBER: PO-30

SHELL BEACH - REACH 3
PLAN & SECTION VIEWS

DATE: FEBRUARY 2007
SHEET 16 OF 34





STATE OF LOUISIANA
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2/14/07

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SHELL BEACH - REACH 3
PLAN & SECTION VIEWS

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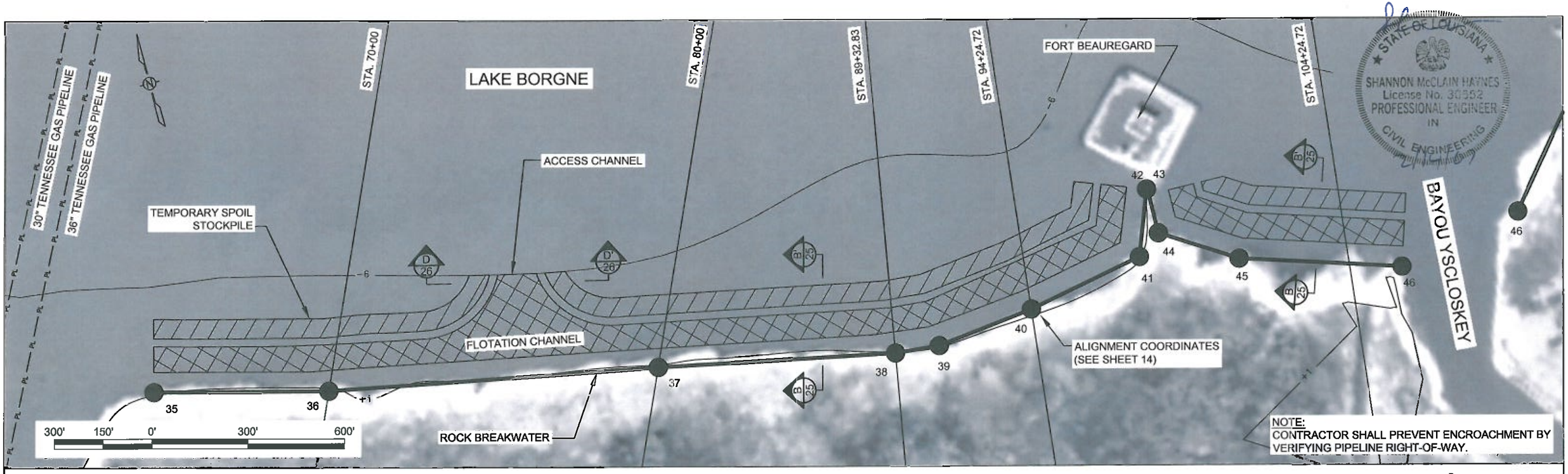

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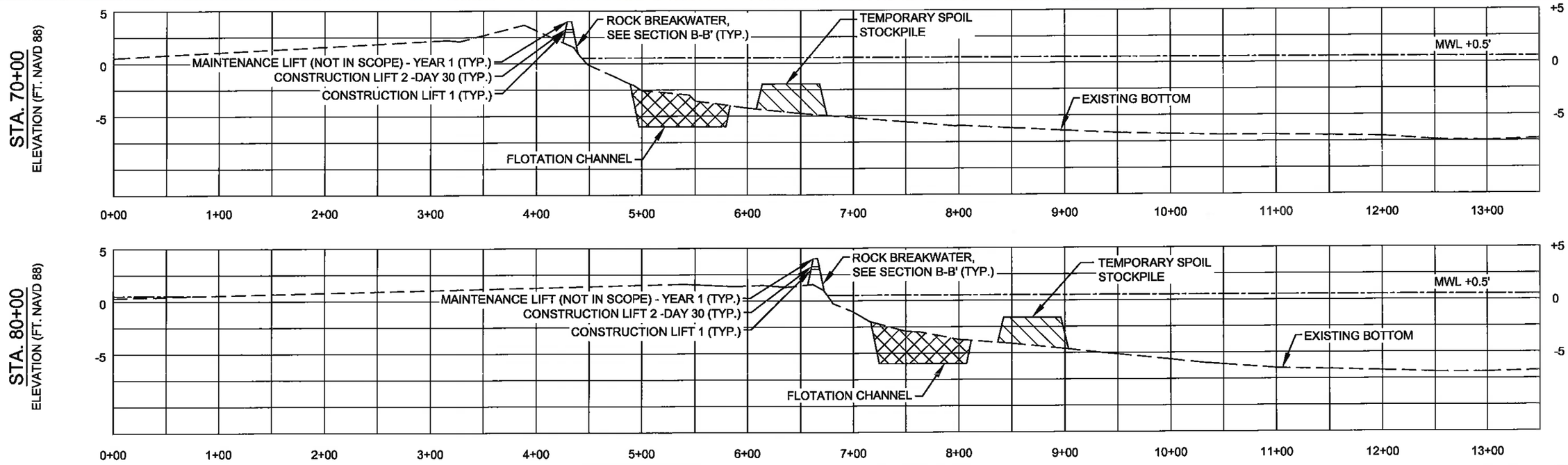

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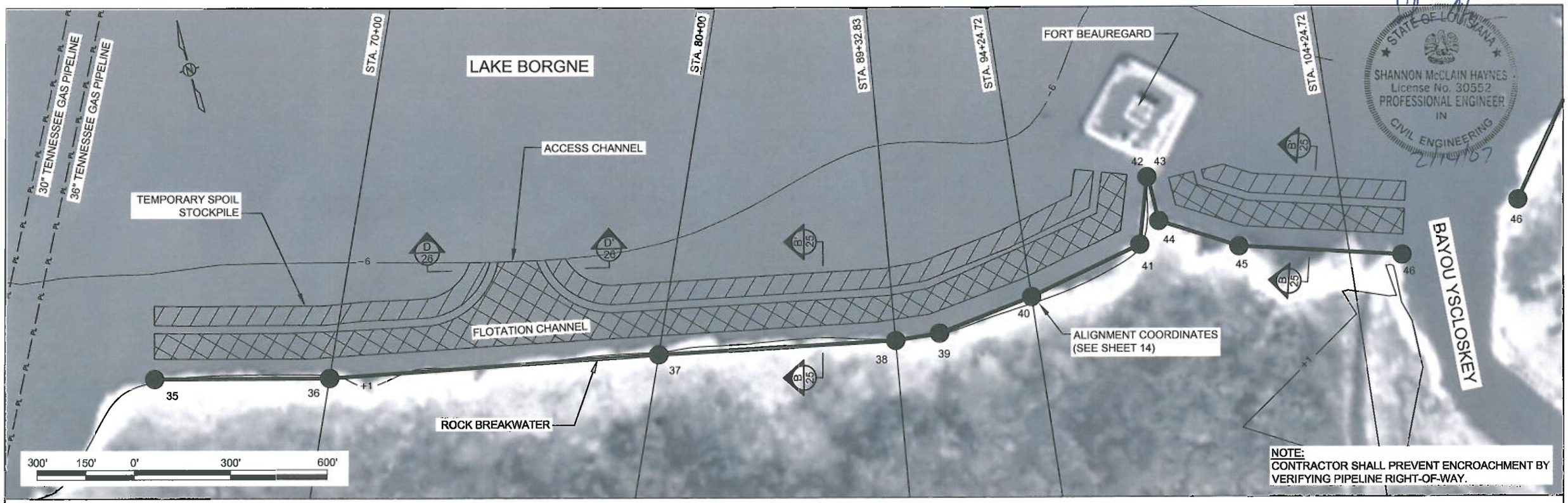
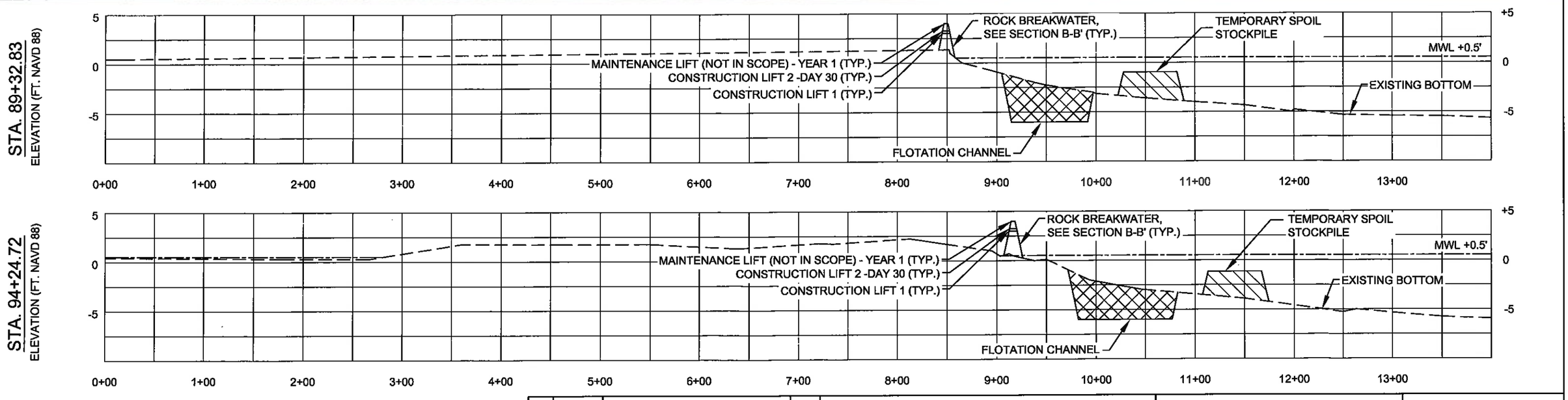
SHELL BEACH - REACH 3
PLAN & SECTION VIEWS

DATE: FEBRUARY 2007
SHEET 18 OF 34





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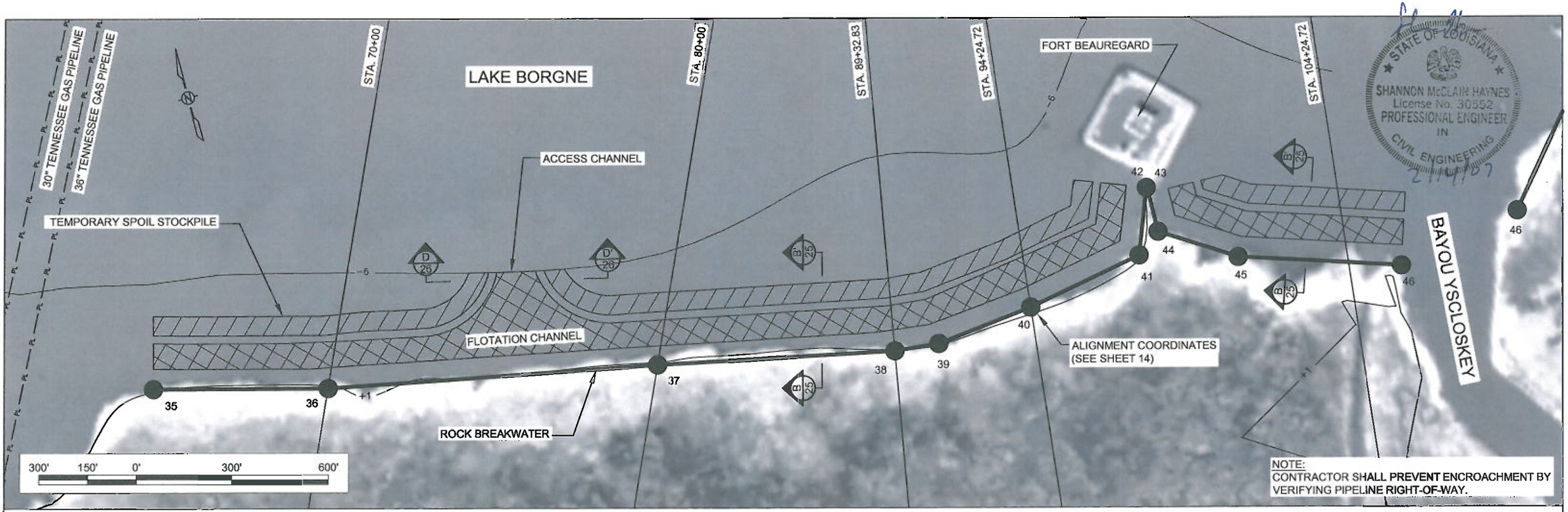
SHEET 19 OF 34



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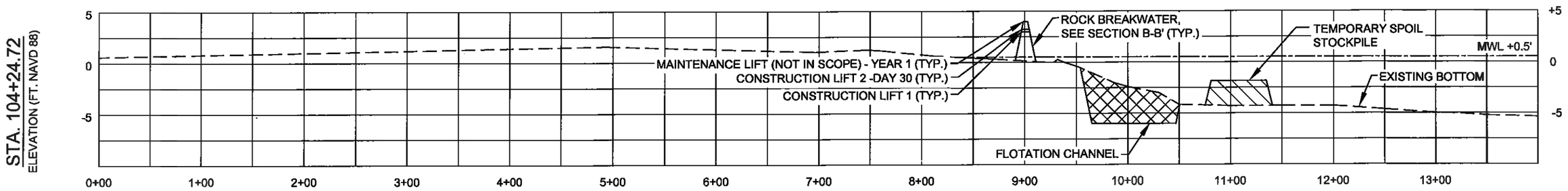

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SHELL BEACH - REACH 3
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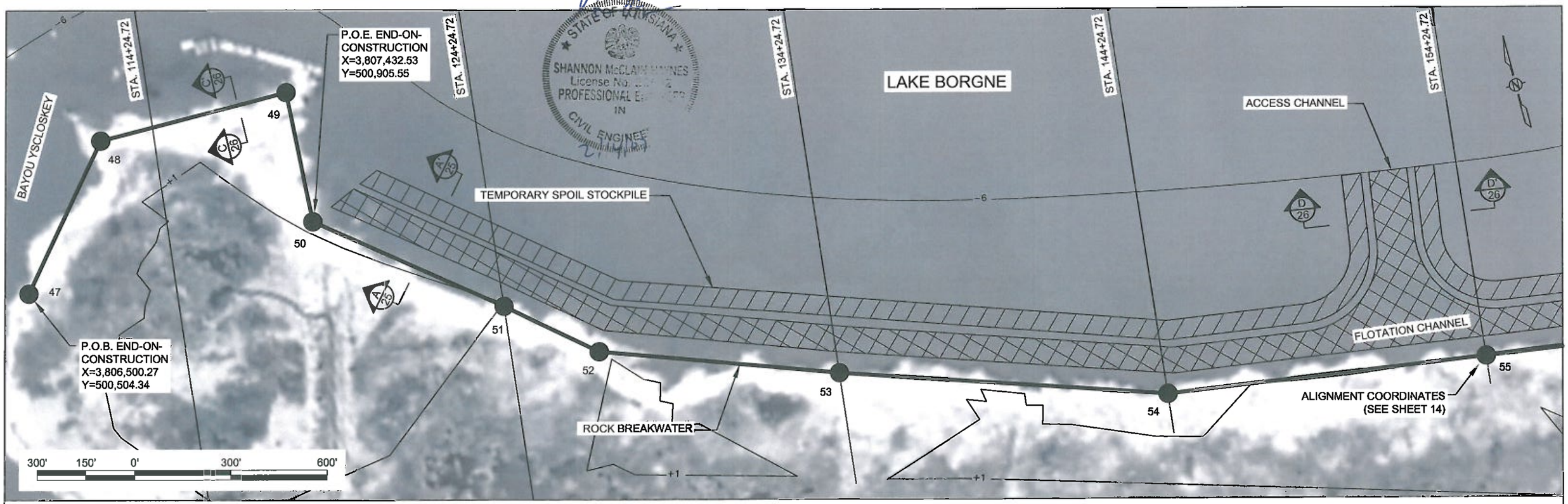
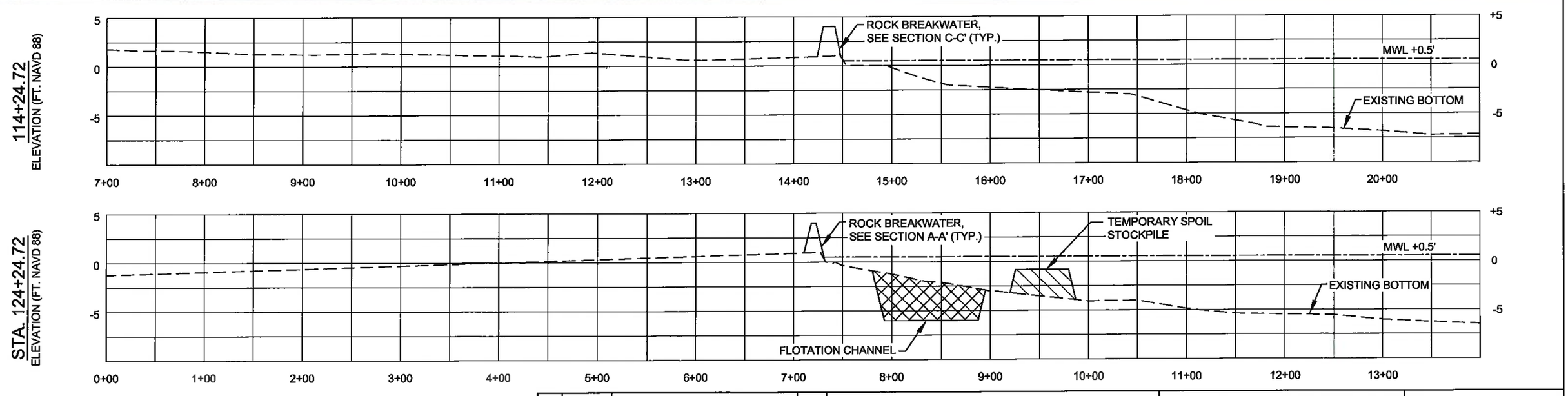
SHEET 20 OF 34





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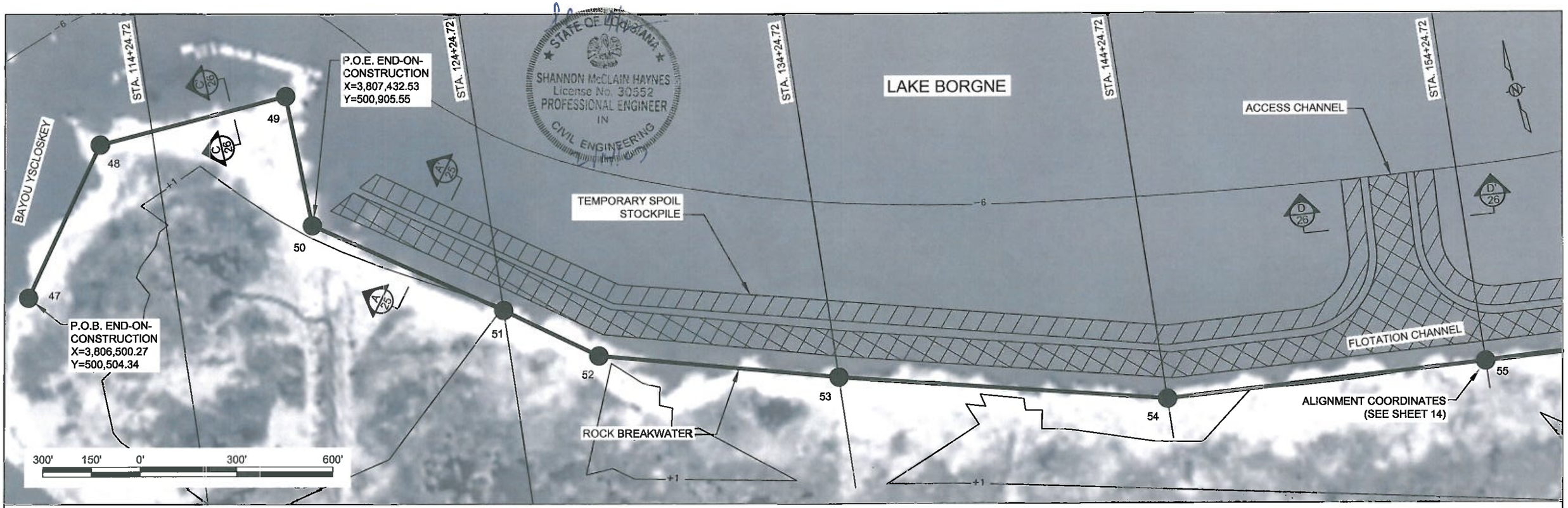
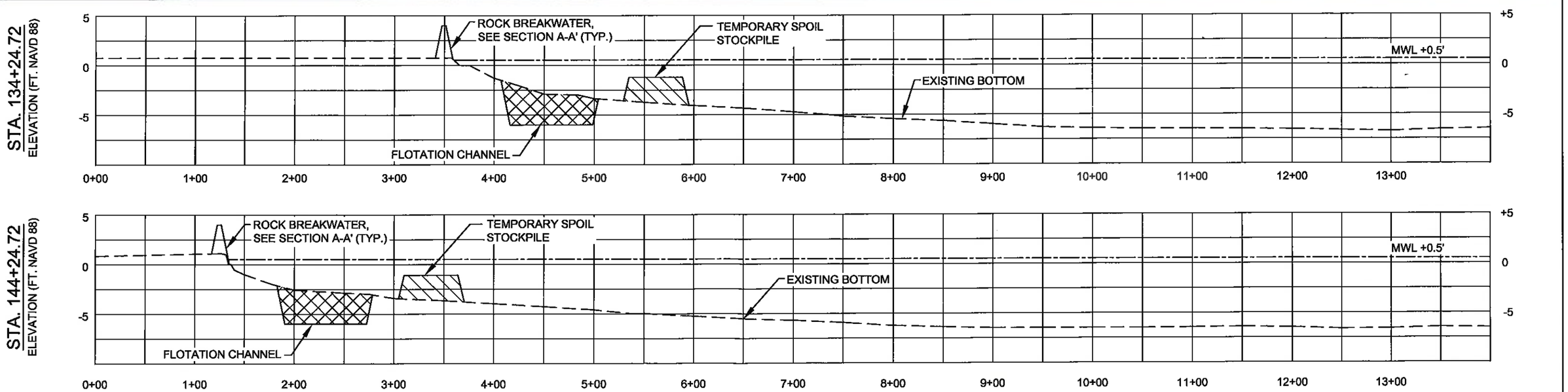
SHELL BEACH - REACH 4
PLAN & SECTION VIEWS
DATE: FEBRUARY 2007
SHEET 21 OF 34





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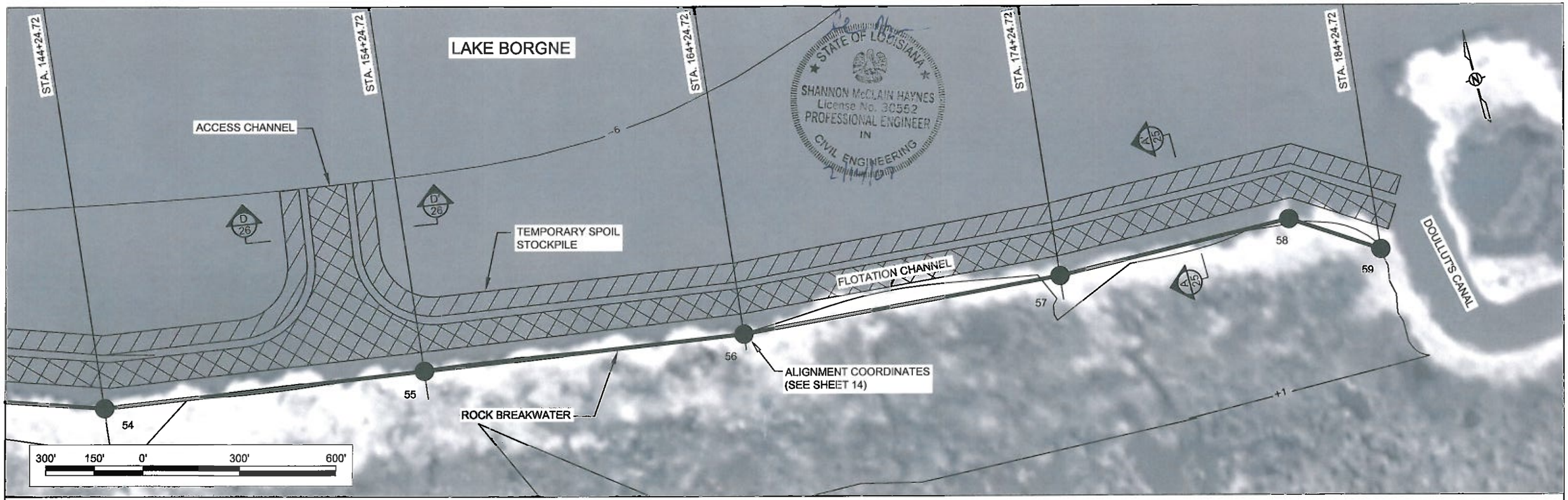

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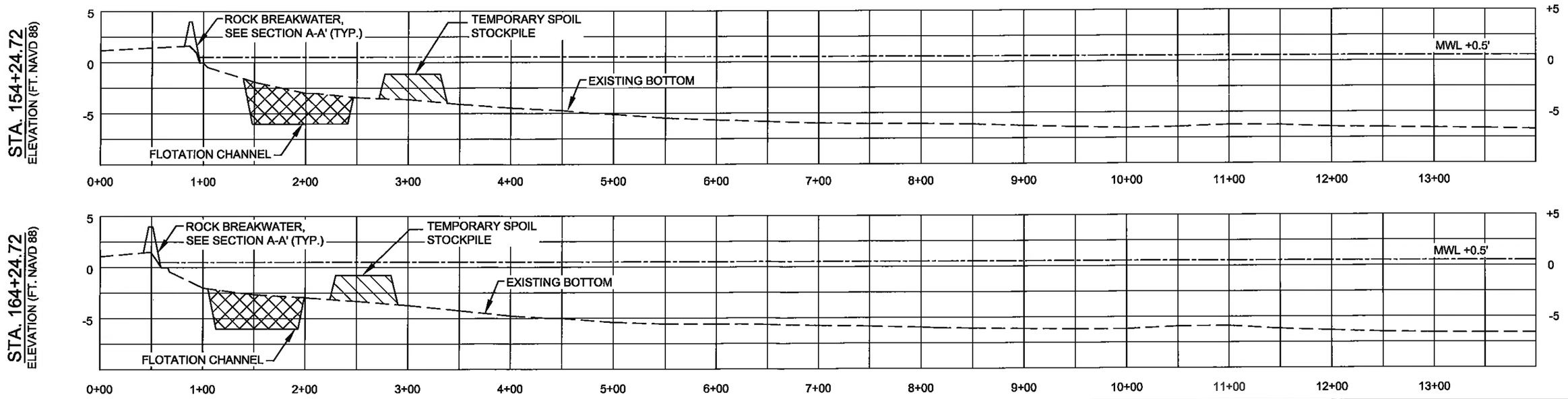

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SHELL BEACH - REACH 4
PLAN & SECTION VIEWS

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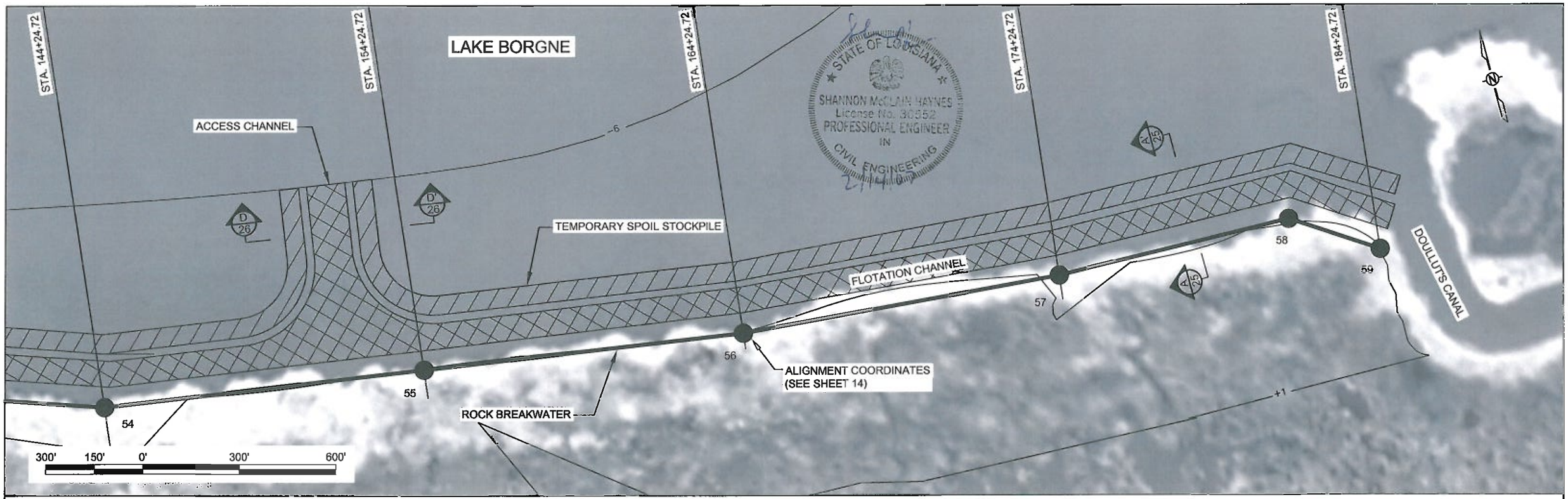
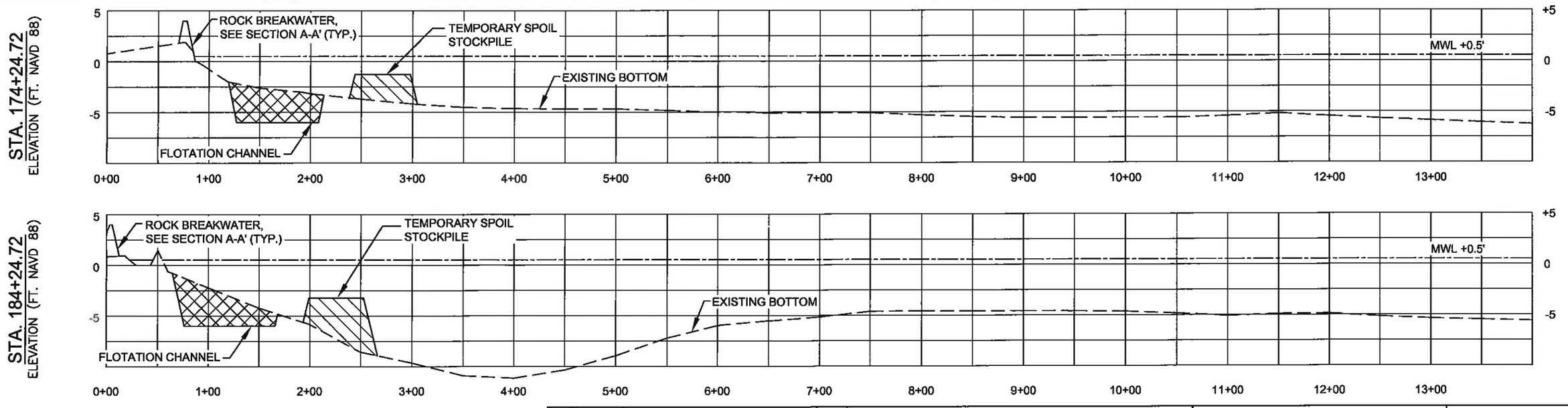
SHEET 23 OF 34





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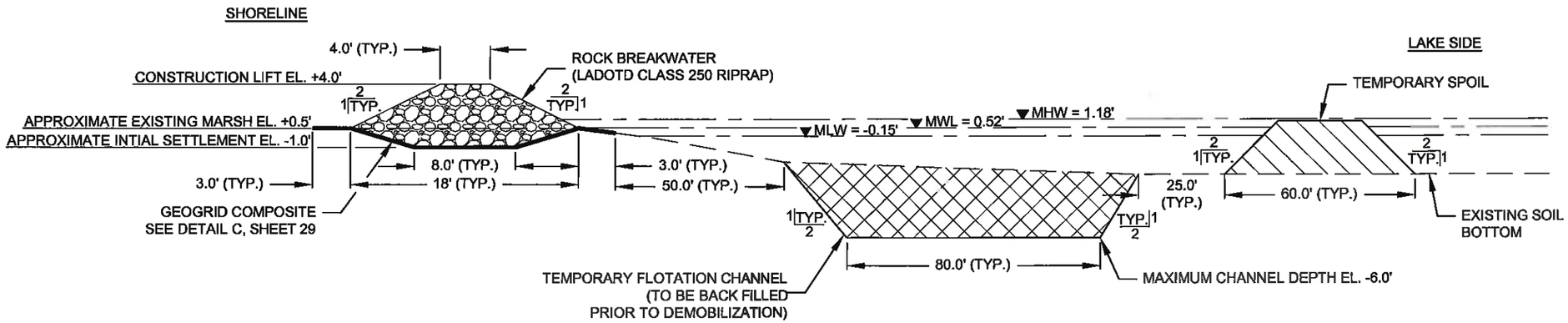
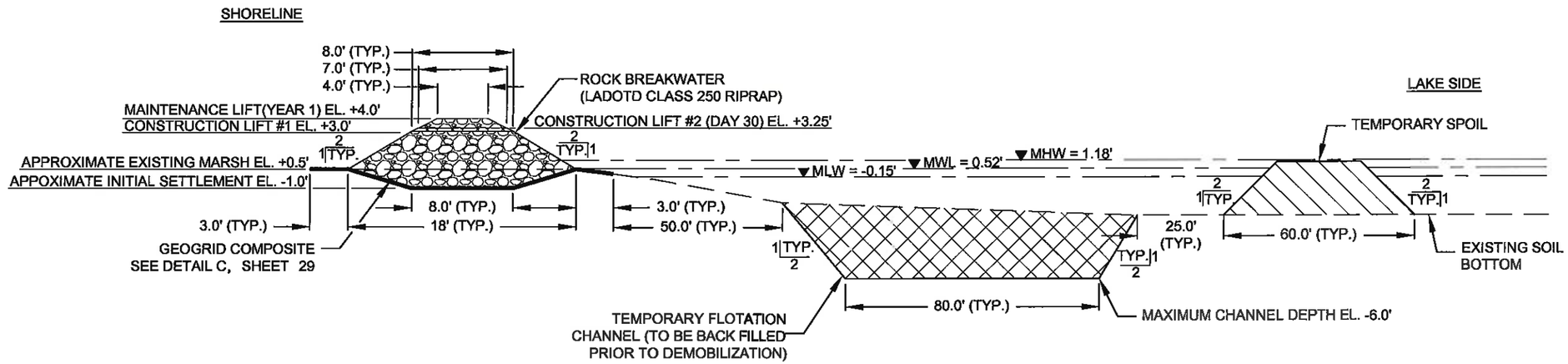
SHELL BEACH - REACH 4
PLAN & SECTION VIEWS

DATE: FEBRUARY 2007
SHEET 24 OF 34



TYPICAL SECTION A-A'

TYPICAL ROCK BREAKWATER FOR **"STRONG"** SOIL PROFILE
FOR ALIGNMENT COORDINATES 18-34 (REACHES 2 AND
PORTION OF 3) AND 50-59 (REACH 4)
NOT TO SCALE



TYPICAL SECTION B-B'

TYPICAL ROCK BREAKWATER FOR **"WEAK"** SOIL PROFILE
FOR ALIGNMENT COORDINATES 1-9 (REACH 1)
AND 35-46 (PORTION OF REACH 3)
NOT TO SCALE

NOTES:

1. ROCK SHALL MEET LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT CLASS 250 POUND STONE, OR OWNER APPROVED EQUIVALENT. GRADATION TESTS OF REPRESENTATIVE STONE (15 TON MIN. SAMPLE SIZE) SHALL BE MADE AT THE QUARRY. CERTIFIED TEST RESULTS MUST BE SUBMITTED AND APPROVED BY ENGINEER PRIOR TO PLACEMENT. THE ROCK PLACEMENT METHOD SHALL PRODUCE A REASONABLY WELL GRADED ROCK MASS WITH VOIDS MINIMIZED AND A VERTICAL TOLERANCE OF 6 INCHES ABOVE FINAL GRADE. ROCK SHALL BE PLACED TO FULL THICKNESS IN ONE LIFT WITH A MAXIMUM DROP OF 1 FOOT TO AVOID DAMAGING THE GEOGRID COMPOSITE. FOLLOWING THE INSPECTIONS AND SURVEYS ON DAYS 1 AND 30, ADDITIONS OF ROCK MAY BE REQUIRED FOR ISOLATED SECTIONS OF THE BREAKWATERS AS DIRECTED BY THE ENGINEER. FLOTATION CHANNELS SHALL NOT BE BACK FILLED UNTIL THE BREAKWATERS HAVE BEEN ACCEPTED BY THE ENGINEER.
2. ANY REFERENCES TO MAINTENANCE LIFTS ARE FOR INFORMATIONAL PURPOSES ONLY AND NOT IN THE CURRENT SCOPE.
3. THE CENTERLINE OF THE ROCK BREAKWATERS SHALL BE CONSTRUCTED ALONG THE ALIGNMENT SHOWN ON SHEETS 4 AND 14. THE ACTUAL ALIGNMENT MAY BE ADJUSTED BY THE ENGINEER PRIOR TO CONSTRUCTION IN ORDER TO MEET CHANGING FIELD CONDITIONS. IF ADDITIONAL QUANTITIES FOR ROCK AND GEOGRID COMPOSITE ARE NECESSARY, THEY WILL BE PAID FOR AT THE UNIT PRICE BID FOR THE ITEM.

STATE OF LOUISIANA
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DRAWN BY: SHANE FAUST | DESIGNED BY: SHANNON HAYNES, P.E.

LAKE BORGNE
SHORELINE PROTECTION

STATE PROJECT NUMBER: PO-30
FEDERAL PROJECT NUMBER: PO-30

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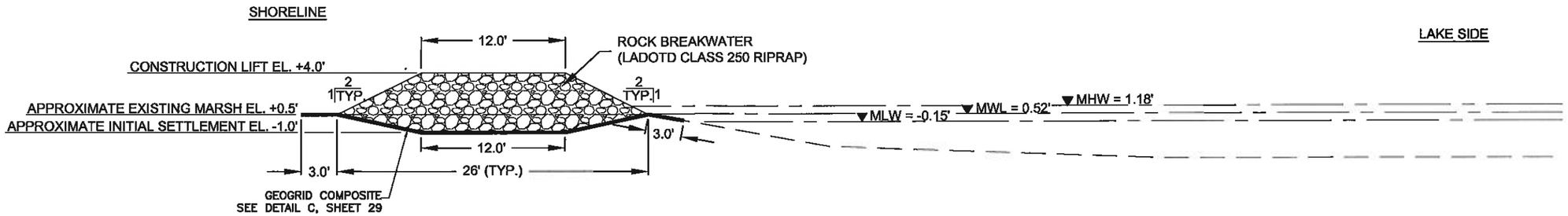
TYPICAL SECTIONS

DATE: FEBRUARY 2007

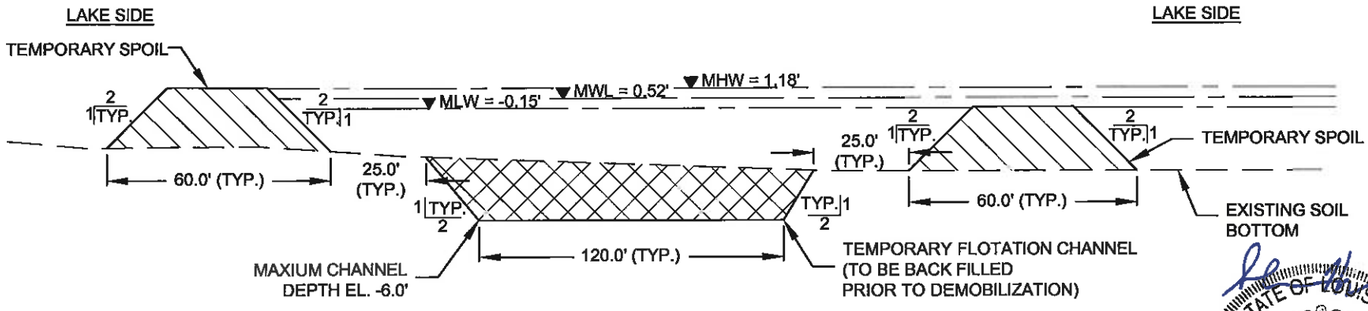


TYPICAL SECTION C-C'

TYPICAL ROCK BREAKWATER BY END-ON-CONSTRUCTION
FOR ALIGNMENT COORDINATES 47-50 (REACH 3)
NOT TO SCALE

NOTES:

1. ROCK SHALL MEET LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT CLASS 250 POUND STONE, OR OWNER APPROVED EQUIVALENT. GRADATION TESTS OF REPRESENTATIVE STONE (15 TON MIN. SAMPLE SIZE) SHALL BE MADE AT THE QUARRY. CERTIFIED TEST RESULTS MUST BE SUBMITTED AND APPROVED BY ENGINEER PRIOR TO PLACEMENT. THE ROCK PLACEMENT METHOD SHALL PRODUCE A REASONABLY WELL GRADED ROCK MASS WITH VOIDS MINIMIZED AND A VERTICAL TOLERANCE OF 6 INCHES ABOVE FINAL GRADE. ROCK SHALL BE PLACED TO FULL THICKNESS IN ONE LIFT WITH A MAXIMUM DROP OF 1 FOOT TO AVOID DAMAGING THE GEOGRID COMPOSITE. FOLLOWING THE INSPECTIONS AND SURVEYS ON DAYS 1 AND 30, ADDITIONS OF ROCK MAY BE REQUIRED FOR ISOLATED SECTIONS OF THE BREAKWATERS AS DIRECTED BY THE ENGINEER. FLOTATION CHANNELS SHALL NOT BE BACK FILLED UNTIL THE BREAKWATERS HAVE BEEN ACCEPTED BY THE ENGINEER.
2. ANY REFERENCES TO MAINTENANCE LIFTS ARE FOR INFORMATIONAL PURPOSES ONLY AND NOT IN THE CURRENT SCOPE.
3. THE CENTERLINE OF THE ROCK BREAKWATERS SHALL BE CONSTRUCTED ALONG THE ALIGNMENT SHOWN ON SHEETS 4 AND 14. THE ACTUAL ALIGNMENT MAY BE ADJUSTED BY THE ENGINEER PRIOR TO CONSTRUCTION IN ORDER TO MEET CHANGING FIELD CONDITIONS. IF ADDITIONAL QUANTITIES FOR ROCK AND GEOGRID COMPOSITE ARE NECESSARY, THEY WILL BE PAID FOR AT THE UNIT PRICE BID FOR THE ITEM.
4. DUE TO THE PRESENCE OF EXISTING STRUCTURES AND DEBRIS, THE ROCK BREAKWATERS NEAR THE FORMER NAVAL FACILITY AT OLD SHELL BEACH SHALL BE CONSTRUCTED USING THE END-ON-CONSTRUCTION TECHNIQUE. THIS TECHNIQUE SHALL EMPLOY LAND BASED EQUIPMENT (I.E. TRUCK, TRACK HOE, ETC.) TO CONSTRUCT THE BREAKWATER WHILE PROGRESSING ALONG THE ALIGNMENT. ACCESS TO THIS PORTION OF THE BREAKWATERS SHALL BE RESTRICTED TO THE ADJACENT FLOTATION CHANNELS AND ROCK BREAKWATERS. THE CREATION OF ADDITIONAL FLOTATION CHANNELS NOT INCLUDED IN THESE PLANS IS STRICTLY PROHIBITED. CONSTRUCTION ACTIVITIES SHALL BE RESTRICTED WITHIN THE WIDTH SPECIFIED IN THE END-ON-CONSTRUCTION DETAIL ON THIS SHEET.
5. THE MAXIMUM RADIUS ON ALL ACCESS CHANNELS COMING INTO THE FLOTATION CHANNELS ARE EQUAL TO 250.0'.



TYPICAL SECTION D-D'

TYPICAL ACCESS CHANNEL
NOT TO SCALE

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TYPICAL SECTIONS

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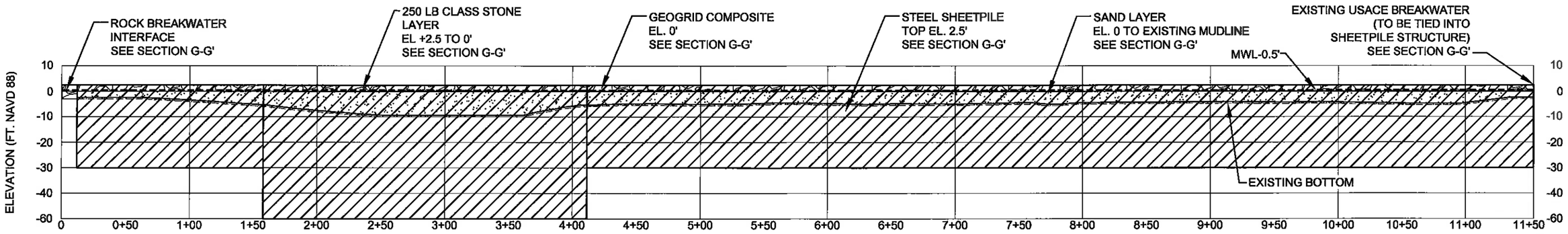
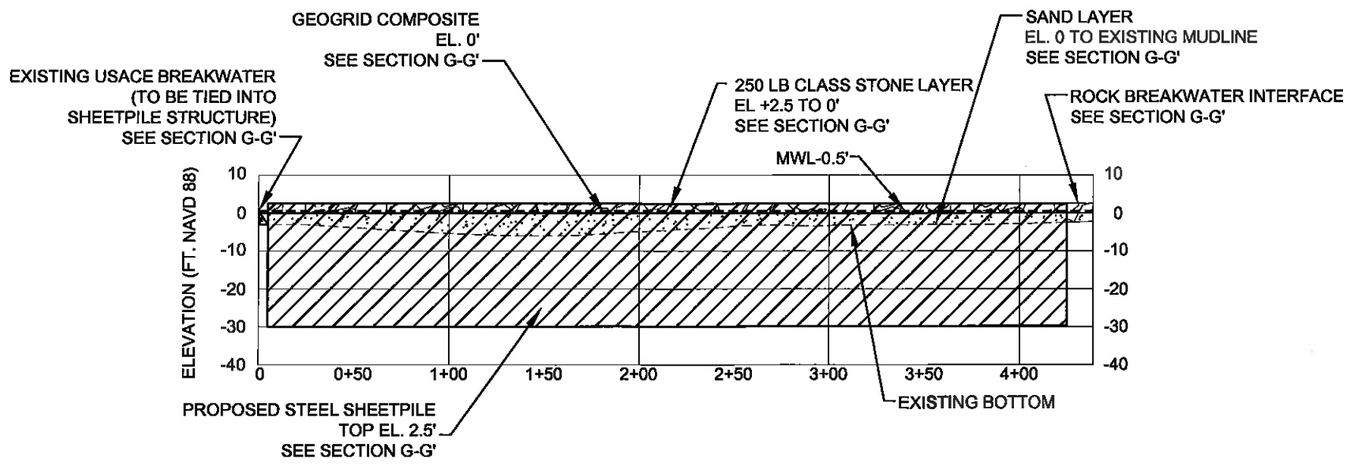
SHEET 26 OF 34



SECTION E-E'

BACK-TO-BACK STEEL SHEETPILE STRUCTURE
FOR ALIGNMENT COORDINATES 9-13 (REACH 1)
NOT TO SCALE



SECTION F-F'

BACK-TO-BACK STEEL SHEETPILE STRUCTURE
FOR ALIGNMENT COORDINATES 14-18 (REACH 2)
NOT TO SCALE

LEGEND
STEEL SHEETPILE
250 LB CLASS STONE
SAND FILL
GEOGRID COMPOSITE

NOTE:
1. SEE SHEETS 30-33 FOR TYPICAL SECTION G-G'.

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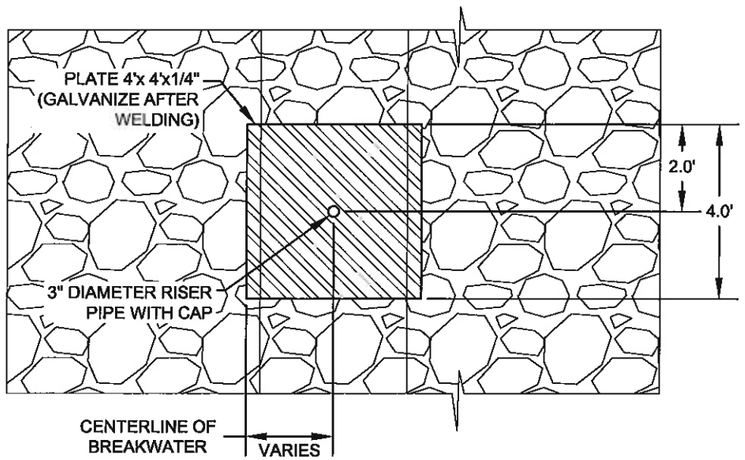
APPROVED BY: LUKE LE BAS, P.E.

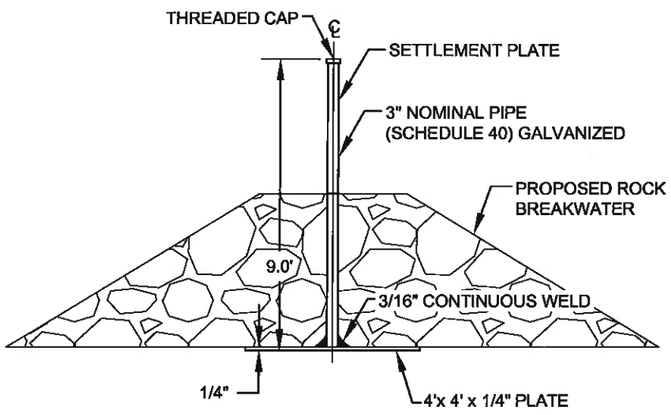
TYPICAL SECTIONS

DATE: FEBRUARY 2007

TOP VIEW



SIDE VIEW



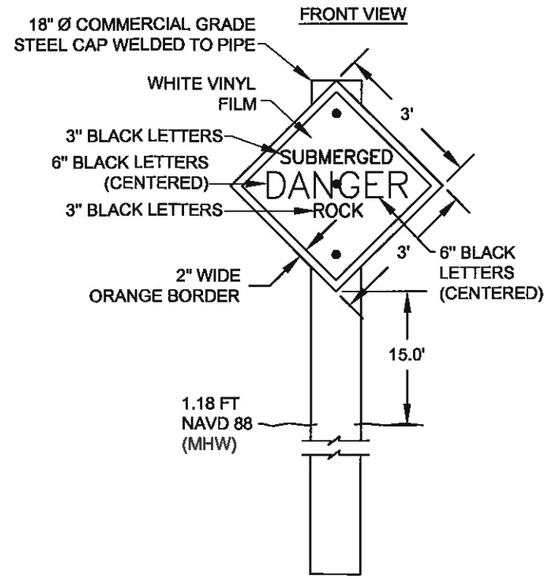
DETAIL A

ROCK SETTLEMENT PLATE
NOT TO SCALE

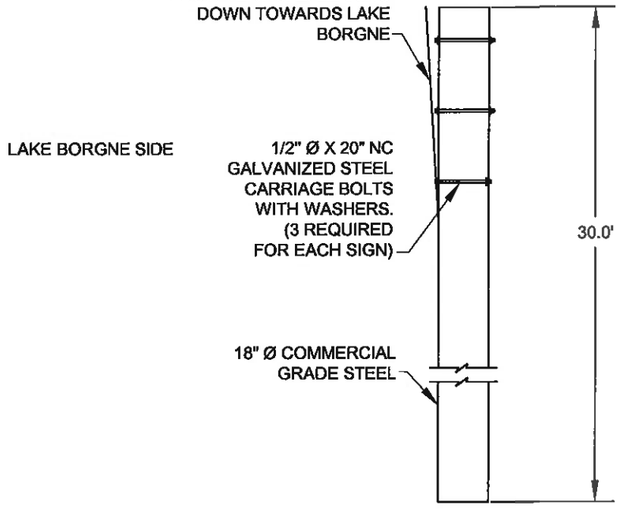
SETTLEMENT PLATE NOTES:

1. SETTLEMENT PLATES SHALL BE INSTALLED ALONG THE CENTERLINE OF THE BREAKWATER AT 1000' INTERVIALS.
2. THE TOP OF ALL SETTLEMENT PLATES SHALL BE SURVEYED DAILY BY THE CONTRACTOR AFTER INSTALLATION UNTIL ALL WORK IS COMPLETED.
3. SETTLEMENT PLATES SHALL BE FABRICATED USING ASTM A36 STEEL AND HOT-DIPPED GALVANIZED.

FRONT VIEW



SIDE VIEW



DETAIL B

WARNING SIGN
NOT TO SCALE

WARNING SIGN NOTES:

1. WARNING SIGNS SHALL BE INSTALLED AT 1000 FT. INTERVALS, 50 FT. OFFSHORE FROM THE CENTERLINE OF THE ROCK BREAKWATERS.
2. THE SIGNS SHALL CONFORM TO THE REGULATIONS IN THE UNITED STATES COAST GUARD (USCG) COMMANDANT DIRECTIVES MANUALS #16500.3 (SERIES), "AIDS TO NAVIGATION MANUAL - TECHNICAL" AND #10360-3 (SERIES), "COATINGS AND COLOR MANUAL."
3. ALL FILM, LETTERS AND BORDERS SHALL BE OBTAINED FROM A USCG QUALIFIED SUPPLIER.
4. ALL LETTERS AND BORDERS SHALL BE RETROREFLECTIVE.
5. NEOPRENE WASHERS SHALL BE PLACED BETWEEN THE SIGN AND THE PILING AT ALL POINTS OF CONTACT.
6. STEEL SUPPORT PIPE AND CAP SHALL BE GALVANIZED OR SAND BLASTED AND PAINTED WITH A MARINE GRADE EPOXY PRIMER AND POLYURETHANE TOPCOAT.

REV.	DATE	DESCRIPTION	BY

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

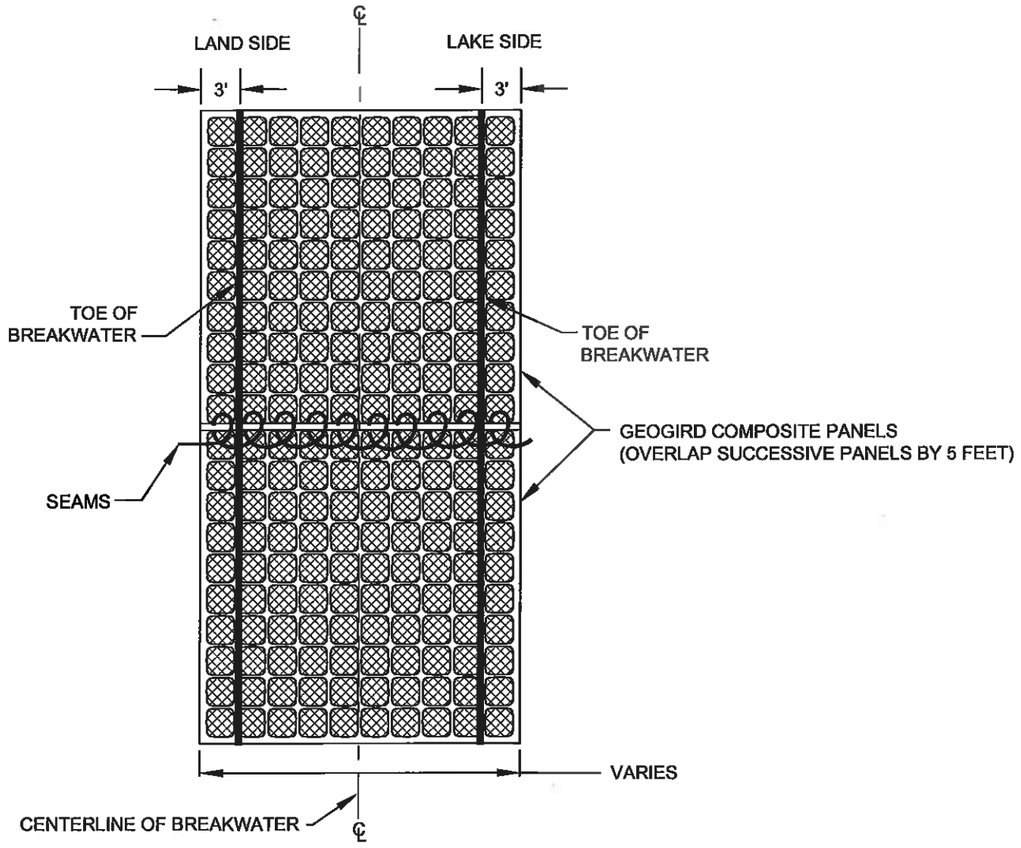
DRAWN BY: SHANE FAUST | DESIGNED BY: SHANNON HAYNES, P.E.

LAKE BORGNE SHORELING PROTECTION

STATE PROJECT NUMBER: PO-30
FEDERAL PROJECT NUMBER: PO-30
APPROVED BY: LUKE LE BAS, P.E.

TYPICAL DETAILS

DATE: FEBRUARY 2007
SHEET 28 OF 34



DETAIL C

GEOGRID COMPOSITE
NOT TO SCALE

NOTES:

1. THE GEOGRID COMPOSITE SHALL OVERLAP THE TOE OF THE BREAKWATER BY A MINIMUM OF 3' ON EACH SIDE. THE OVERLAP AT THE PANEL ENDS SHALL BE A MINIMUM OF FIVE (5) FEET WIDE AND PARALLEL TO THE BREAKWATER CENTERLINE UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

2. EACH PANEL SHALL CONSISTS OF GEOTEXTILE STRIPS THAT ARE FASTENED BY KEVLAR THREADS (OR EQUIVALENT) AND OVERLAIN BY GEOGRID THAT IS MECHANICALLY CONNECTED BY DOUBLE STITCHED SEAMS. THE COLOR OF THE THREADS SHALL BE IN CONTRAST TO THE GEOGRID AND GEOTEXTILE.

3. EACH ROW OF STITCHING SHALL BE LOCATED A MINIMUM OF TWO (2) INCHES FROM THE GEOTEXTILE EDGE.

STATE OF LOUISIANA
SHANNON McCLAIN HAYNES
License No. 30552
PROFESSIONAL ENGINEER
IN
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2/14/07

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LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

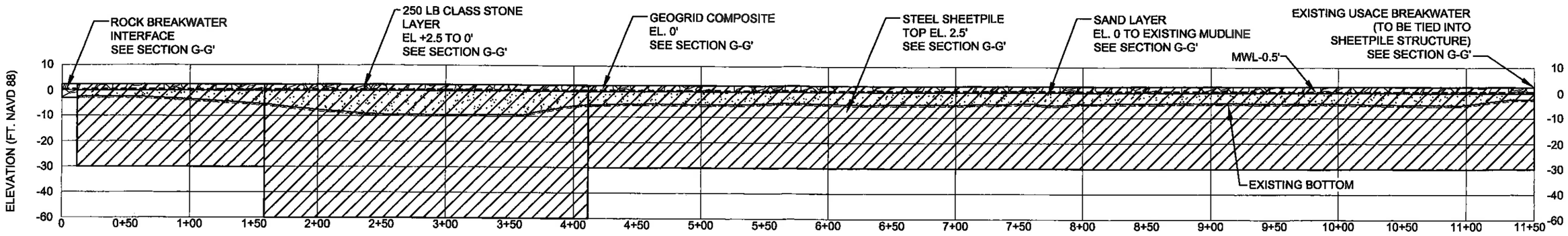
DRAWN BY: SHANE FAUST | DESIGNED BY: SHANNON HAYNES, P.E.

LAKE BORGNE
SHORELING PROTECTION

STATE PROJECT NUMBER: PO-30
FEDERAL PROJECT NUMBER: PO-30
APPROVED BY: LUKE LE BAS, P.E.

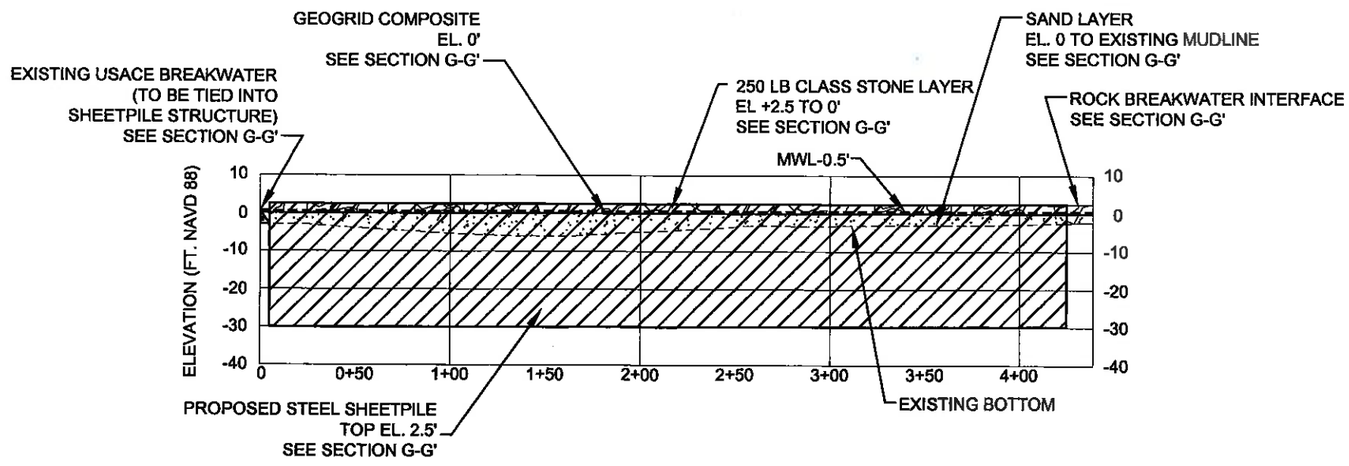
TYPICAL DETAILS

DATE: FEBRUARY 2007
SHEET 29 OF 34



SECTION E-E'

BACK-TO-BACK STEEL SHEETPILE STRUCTURE
FOR ALIGNMENT COORDINATES 9-13 (REACH 1)
NOT TO SCALE



SECTION F-F'

BACK-TO-BACK STEEL SHEETPILE STRUCTURE
FOR ALIGNMENT COORDINATES 14-18 (REACH 2)
NOT TO SCALE

LEGEND
STEEL SHEETPILE
250 LB CLASS STONE
SAND FILL
GEOGRID COMPOSITE

NOTE:
1. SEE SHEETS 30-33 FOR TYPICAL SECTION G-G'.

STATE OF LOUISIANA
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LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

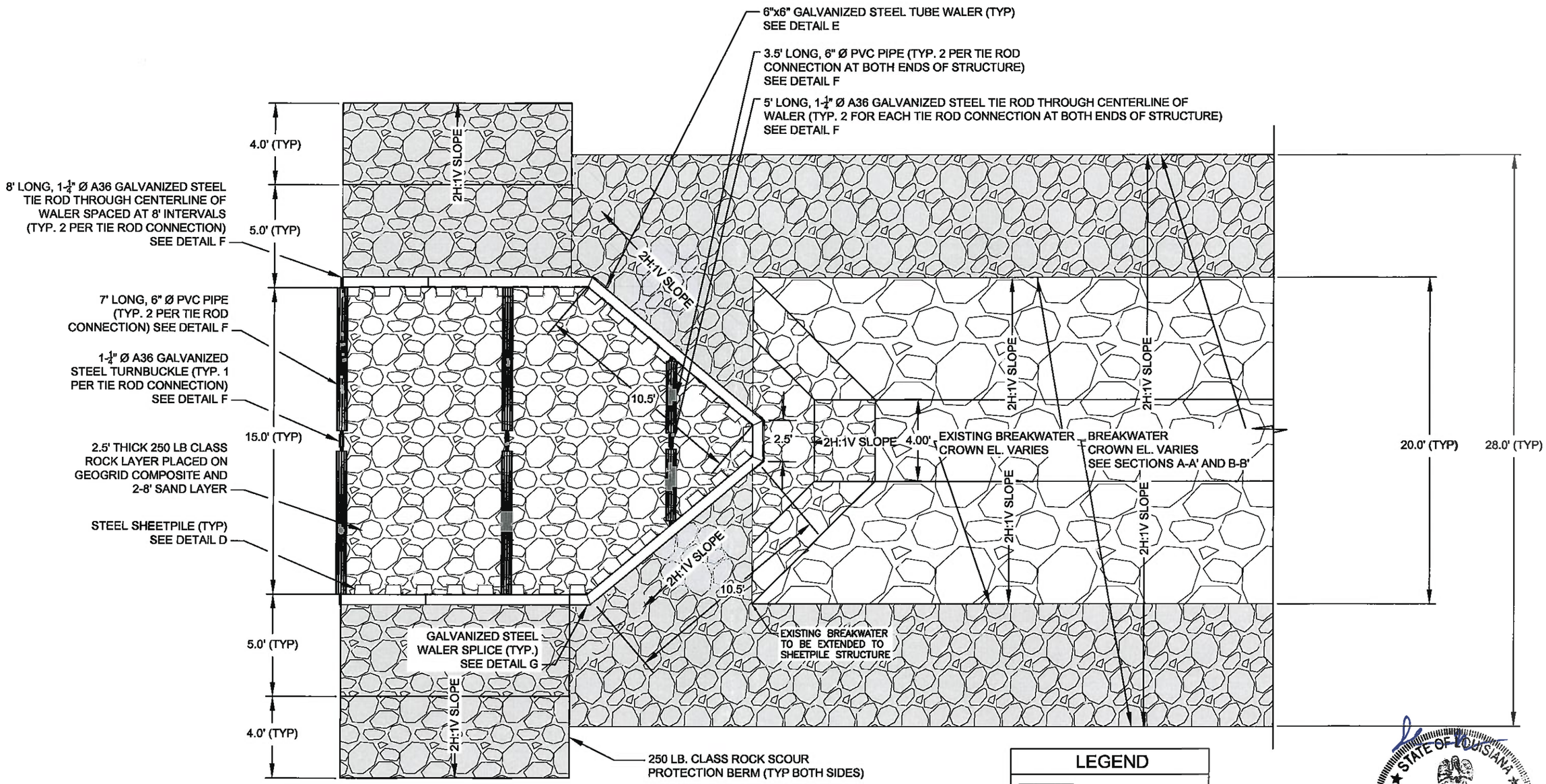
DRAWN BY: SHANE FAUST
DESIGNED BY: SHANNON HAYNES, P.E.
APPROVED BY: LUKE LE BAS, P.E.

LAKE BORGNE
SHORELINE PROTECTION

STATE PROJECT NUMBER: PO-30
FEDERAL PROJECT NUMBER: PO-30

TYPICAL SECTIONS

DATE: FEBRUARY 2007
SHEET 27 OF 34



TYPICAL SECTION G-G'

TOP VIEW

ROCK BREAKWATER AND SHEET PILE INTERFACE
FOR ALIGNMENT COORDINATES 9-18 (REACHES 1 AND 2)
NOT TO SCALE

LEGEND
250 LB CLASS STONE
EXISTING STONE
GEOGRID COMPOSITE

NOTES:
1. SEE SHEET 25 FOR SECTIONS A-A' AND B-B'.
2. SEE SHEET 29 FOR DETAIL C.
3. SEE SHEET 34 FOR DETAILS D, E, F, G, AND H.
4. 2" WEEP HOLES SHALL BE DRILLED AT ELEVATION +0.5' NAVD88 SPACED ON 5' CENTERS. GEOGRID COMPOSITE LAYER SHALL OVERLAP EACH HOLE.
5. SEE TECHNICAL SPECIFICATIONS FOR SAND.
6. SAND LAYER SHALL BE MONITORED FOR SETTLEMENT AND BACKFILLED TO MAINTAIN ELEVATION 0' FOR A MINIMUM OF 30 DAYS PRIOR TO PLACEMENT OF GEOGRID COMPOSITE AND STONE LAYER.
7. EXISTING BREAKWATERS ARE TO BE EXTENDED TO SHEETPILE STRUCTURE USING ADDITIONAL ROCK.

STATE OF LOUISIANA
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COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

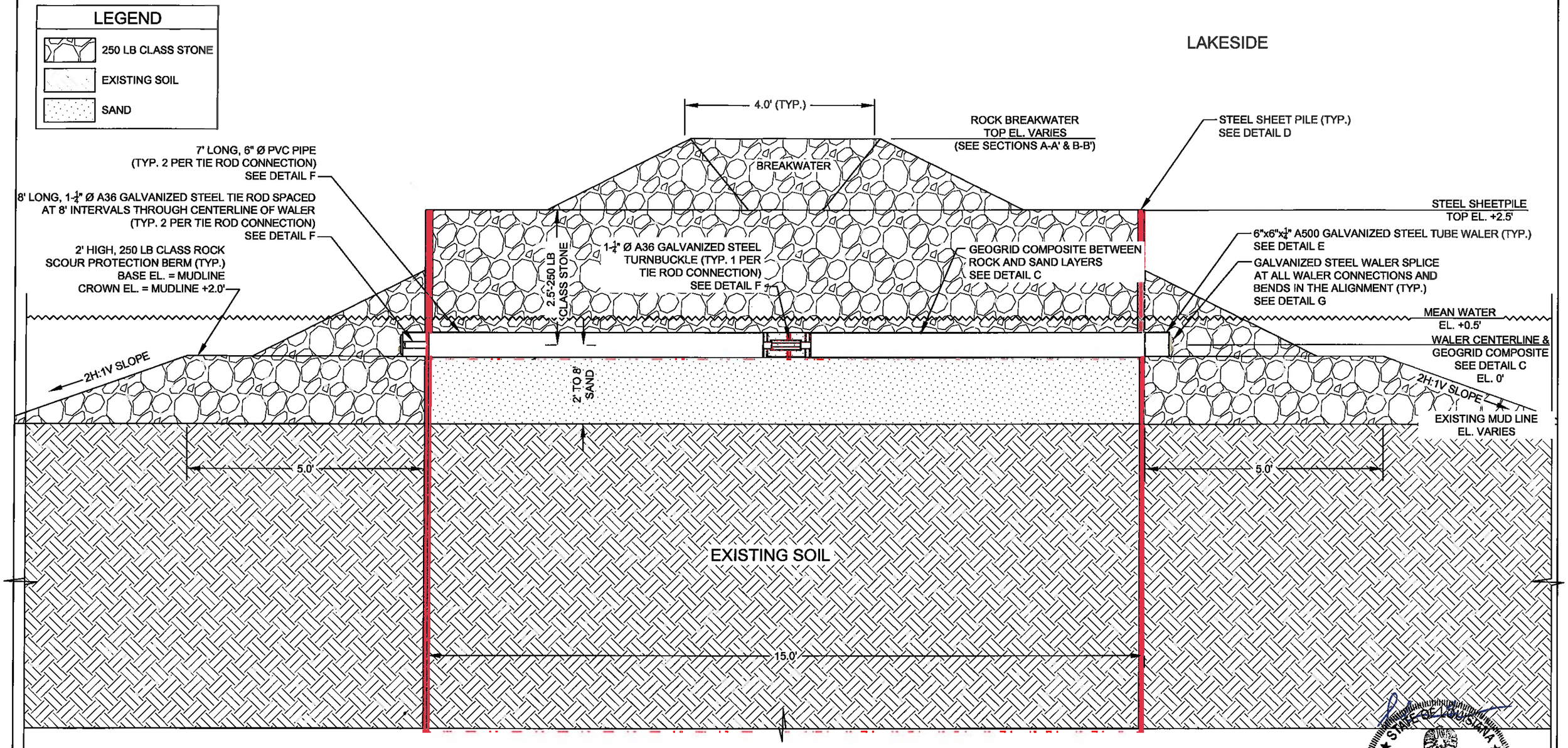
DRAWN BY: SHANE FAUST | DESIGNED BY: SHANNON HAYNES, P.E. | APPROVED BY: LUKE LE BAS, P.E.

LAKE BORGNE
SHORELINE PROTECTION

STATE PROJECT NUMBER: PO-30
FEDERAL PROJECT NUMBER: N/A

TYPICAL SHEET PILE STRUCTURE SECTIONS

DATE: FEBRUARY 2007



TYPICAL SECTION G-G'
FRONT VIEW

ROCK BREAKWATER AND SHEET PILE INTERFACE
FOR ALIGNMENT COORDINATES 9-18 (REACHES 1 AND 2)
NOT TO SCALE

NOTES:
1. SEE SHEET 25 FOR SECTIONS A-A' AND B-B'.
2. SEE SHEET 29 FOR DETAIL C.
3. SEE SHEET 34 FOR DETAILS D, E, F, G, AND H.
4. 2" WEEP HOLES SHALL BE DRILLED AT ELEVATION +0.5' NAVD88 SPACED ON 5' CENTERS. GEOGRID COMPOSITE LAYER SHALL OVERLAP EACH HOLE.
5. SEE TECHNICAL SPECIFICATIONS FOR SAND.
6. SAND LAYER SHALL BE MONITORED FOR SETTLEMENT AND BACKFILLED TO MAINTAIN ELEVATION 0' FOR A MINIMUM OF 30 DAYS PRIOR TO PLACEMENT OF GEOGRID COMPOSITE AND STONE LAYER.
7. EXISTING BREAKWATERS ARE TO BE EXTENDED TO SHEETPILE STRUCTURE USING ADDITIONAL ROCK.

REV.	DATE	DESCRIPTION	BY

STATE OF LOUISIANA
SHANNON McCLAIN HAYNES
License No. 30552
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

DRAWN BY: SHANE FAUST | DESIGNED BY: SHANNON HAYNES, P.E.

LAKE BORGNE
SHORELINE PROTECTION

STATE PROJECT NUMBER: PO-30

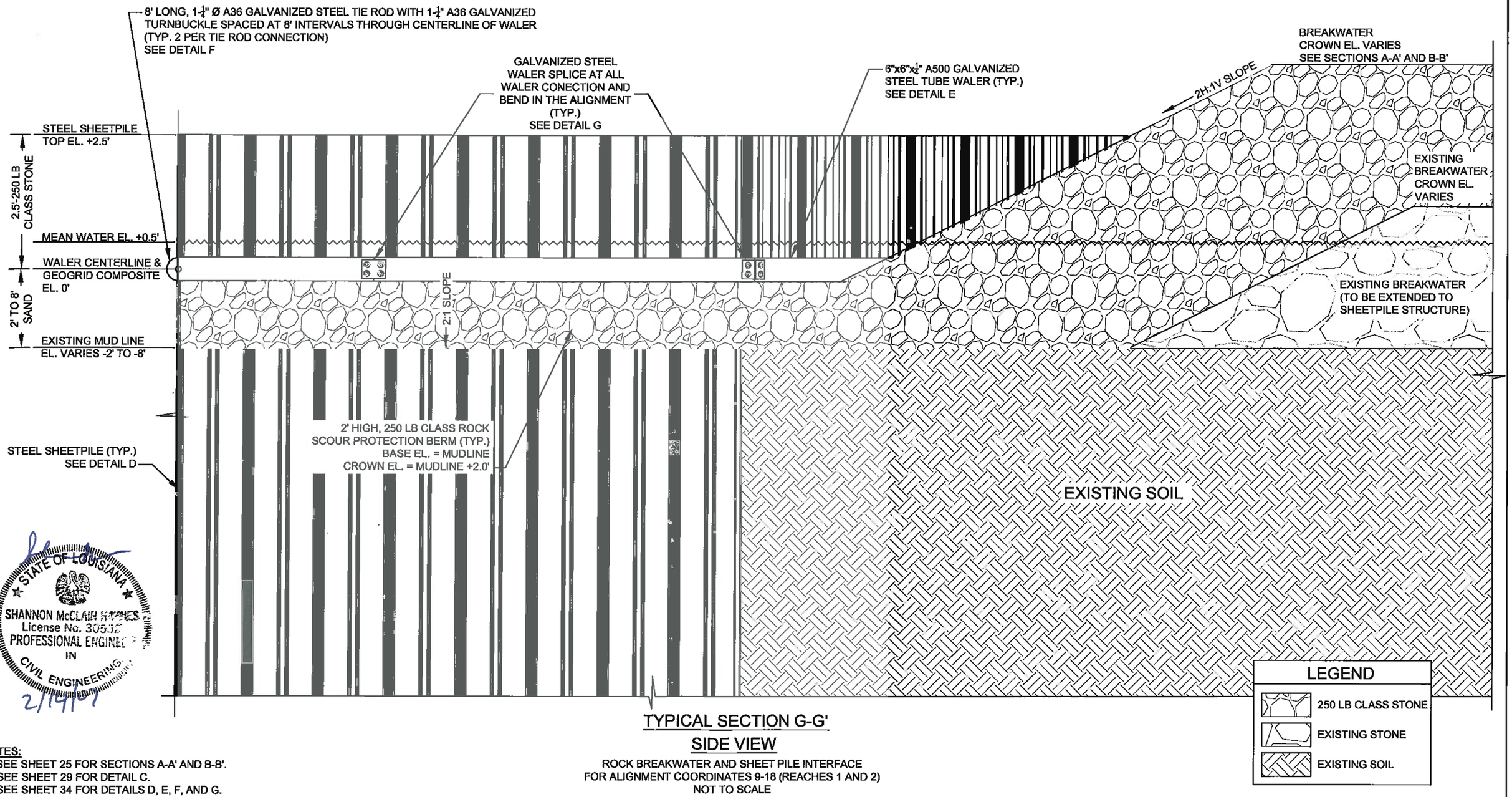
FEDERAL PROJECT NUMBER: N/A

APPROVED BY: LUKE LE BAS, P.E.

TYPICAL SHEET PILE
STRUCTURE SECTIONS

DATE: FEBRUARY 2007

SHEET 31 OF 34



STATE OF LOUISIANA
SHANNON McCLAIN HAYNES
License No. 30532
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
2/14/07

TYPICAL SECTION G-G'
SIDE VIEW

ROCK BREAKWATER AND SHEET PILE INTERFACE
FOR ALIGNMENT COORDINATES 9-18 (REACHES 1 AND 2)
NOT TO SCALE

NOTES:
1. SEE SHEET 25 FOR SECTIONS A-A' AND B-B'.
2. SEE SHEET 29 FOR DETAIL C.
3. SEE SHEET 34 FOR DETAILS D, E, F, AND G.
4. 2" WEEP HOLES SHALL BE DRILLED AT ELEVATION +0.5' NAVD88 SPACED ON 5' CENTERS. GEOGRID COMPOSITE LAYER SHALL OVERLAP EACH HOLE.
4. SEE TECHNICAL SPECIFICATIONS FOR SAND.
5. SAND LAYER SHALL BE MONITORED FOR SETTLEMENT AND BACKFILLED TO MAINTAIN ELEVATION 0' FOR A MINIMUM OF 30 DAYS PRIOR TO PLACEMENT OF GEOGRID COMPOSITE AND STONE LAYER.
6. EXISTING BREAKWATERS ARE TO BE EXTENDED TO SHEETPILE STRUCTURE USING ADDITIONAL ROCK.

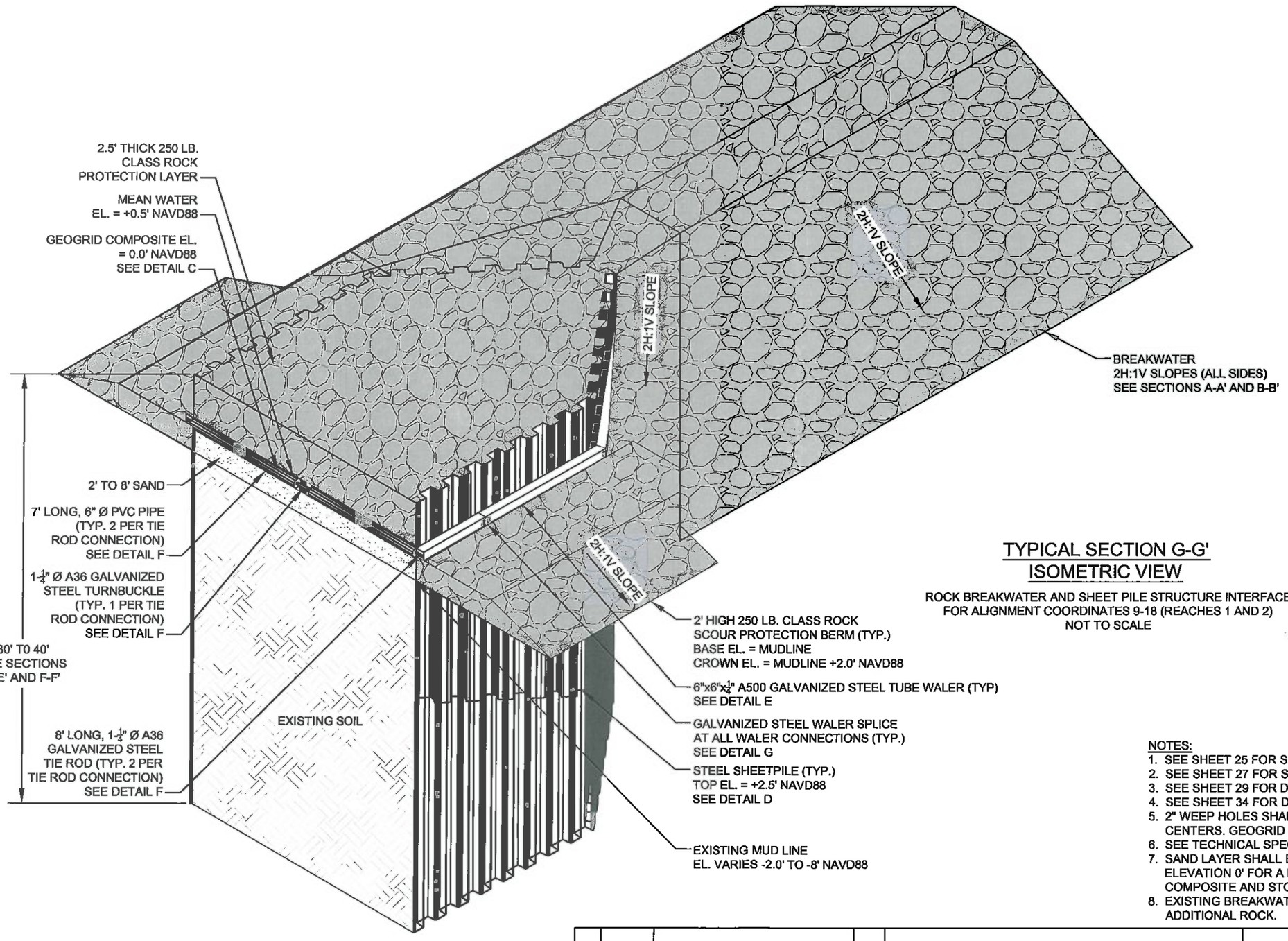
REV.	DATE	DESCRIPTION	BY

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

DRAWN BY: SHANE FAUST | DESIGNED BY: SHANNON HAYNES, P.E.

LAKE BORGNE SHORELINE PROTECTION
STATE PROJECT NUMBER: PO-30
FEDERAL PROJECT NUMBER: N/A
APPROVED BY: LUKE LE BAS, P.E.

TYPICAL SHEET PILE STRUCTURE SECTIONS
DATE: FEBRUARY 2007
SHEET 32 OF 34



TYPICAL SECTION G-G'
ISOMETRIC VIEW

ROCK BREAKWATER AND SHEET PILE STRUCTURE INTERFACE
FOR ALIGNMENT COORDINATES 9-18 (REACHES 1 AND 2)
NOT TO SCALE

LEGEND

- 250 LB CLASS STONE
- GEOGRID COMPOSITE
- SAND
- EXISTING SOIL

STATE OF LOUISIANA
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PROFESSIONAL ENGINEER
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NOTES:
1. SEE SHEET 25 FOR SECTIONS A-A' AND B-B'.
2. SEE SHEET 27 FOR SECTIONS E-E' AND F-F'.
3. SEE SHEET 29 FOR DETAIL C.
4. SEE SHEET 34 FOR DETAILS D, E, F, AND G.
5. 2" WEEP HOLES SHALL BE DRILLED AT ELEVATION +0.5' NAVD88 SPACED ON 5' CENTERS. GEOGRID COMPOSITE LAYER SHALL OVERLAP EACH HOLE.
6. SEE TECHNICAL SPECIFICATIONS FOR SAND.
7. SAND LAYER SHALL BE MONITORED FOR SETTLEMENT AND BACKFILLED TO MAINTAIN ELEVATION 0' FOR A MINIMUM OF 30 DAYS PRIOR TO PLACEMENT OF GEOGRID COMPOSITE AND STONE LAYER.
8. EXISTING BREAKWATERS ARE TO BE EXTENDED TO SHEETPILE STRUCTURE USING ADDITIONAL ROCK.

REV.	DATE	DESCRIPTION	BY

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

LAKE BORGNE SHORELINE PROTECTION

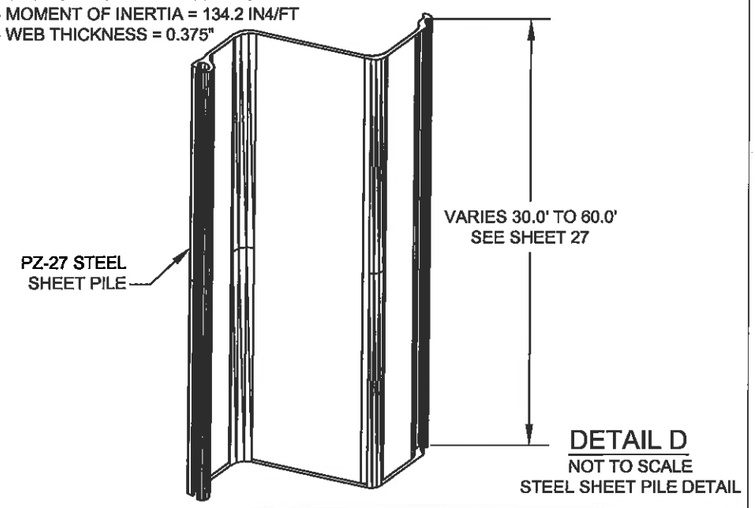
STATE PROJECT NUMBER: PO-30
FEDERAL PROJECT NUMBER: N/A

TYPICAL SHEET PILE STRUCTURE SECTIONS

DATE: FEBRUARY 2007

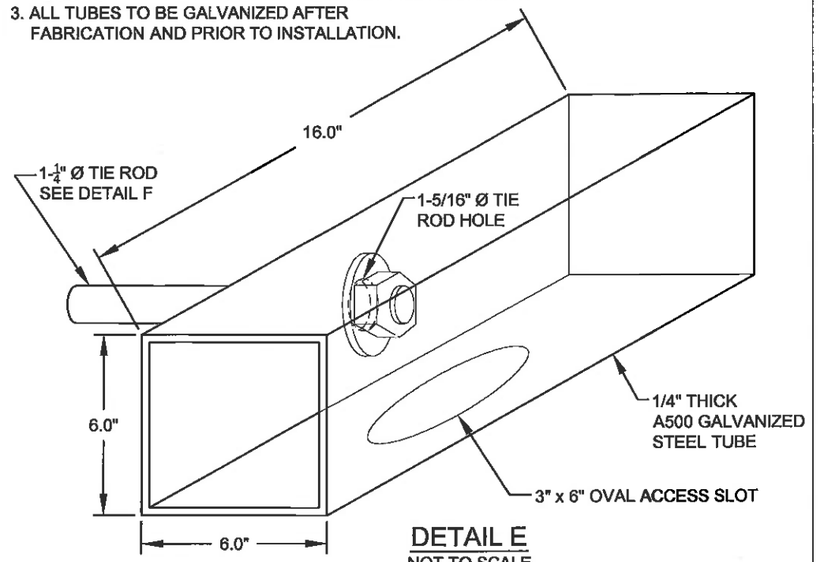
DRAWN BY: SHANE FAUST | DESIGNED BY: SHANNON HAYNES, P.E. | APPROVED BY: LUKE LE BAS, P.E.

NOTES:
1. GALVANIZED COATING SHALL BE APPLIED AS PER PROJECT SPECIFICATIONS.
2. 2" DIAMETER WEEP HOLES SHALL BE DRILLED INTO SHEET PILES AT ELEVATION +0.5' NAVD88 USING 5' SPACING ON CENTERS.
3. 1-5/16" Ø TIE ROD HOLES SHALL BE DRILLED INTO SHEET PILES IN CONJUNCTION WITH TIE RODS AND WALERS.
4. STEEL SHEET PILE SHALL BE PZ-27 SECTIONS OR EQUIVALENT WITH THE FOLLOWING PROPERTIES:
   - SECTION MODULUS = 30.2 IN3/FT
   - MOMENT OF INERTIA = 134.2 IN4/FT
   - WEB THICKNESS = 0.375"



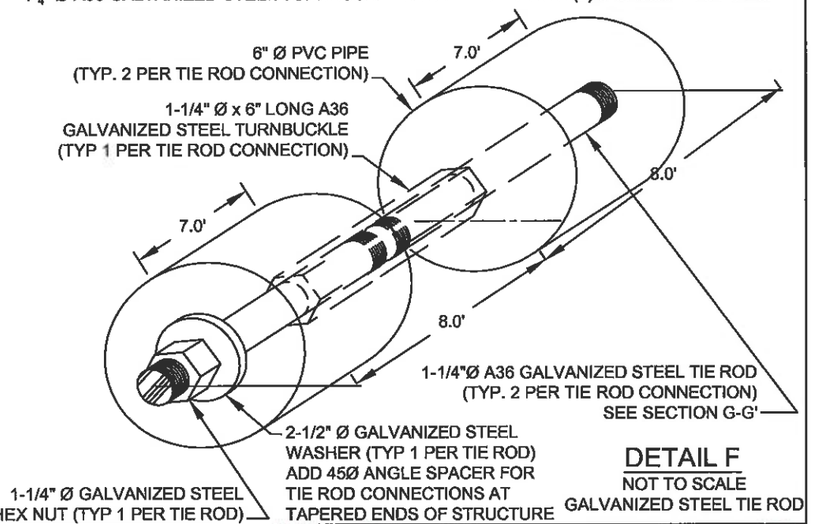
DETAIL D
NOT TO SCALE
STEEL SHEET PILE DETAIL

NOTES:
1. SUCCESSIVE TUBES TO BE JOINED USING SPLIC IN DETAIL H.
2. TUBES SHALL BE CUT TO PROPER ANGLE IN SHOP TO ACCOMODATE ALL ANGLES IN THE SHEET PILE ALIGNMENT.
3. ALL TUBES TO BE GALVANIZED AFTER FABRICATION AND PRIOR TO INSTALLATION.



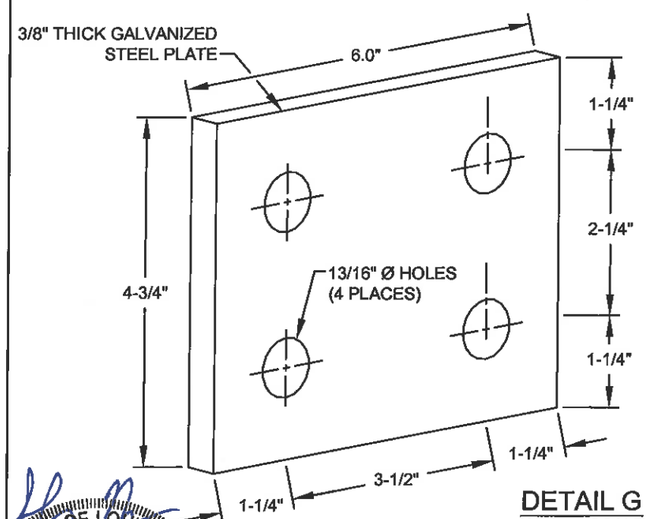
DETAIL E
NOT TO SCALE
GALVANIZED STEEL TUBE WALER DETAIL

NOTES:
1. FINAL TENSION SHALL BE APPLIED TO THE NUTS ON EITHER END OF THE TIE ROD, NOT THE TURN BUCKLE.
2. 6" Ø PVC PIPES SHALL BE SLEEVED OVER TIE ROD PRIOR TO INSTALLATION OF TURNBUCKLE. PVC PIPE TO BE EVENLY DISTRIBUTED OVER TIE ROD AFTER TURNBUCKLE IS TENSIONED.
3. A THE ENDS OF THE STRUCTURE, THE (2) TIE RODS SHALL BE 1-¼" Øx5.0' FASTENED WITH (1) 1-¼" Ø A36 GALVANIZED STEEL TURNBUCKLE AND SLEEVED WITH (2) 6" Ø x 3.5' PVC PIPES.

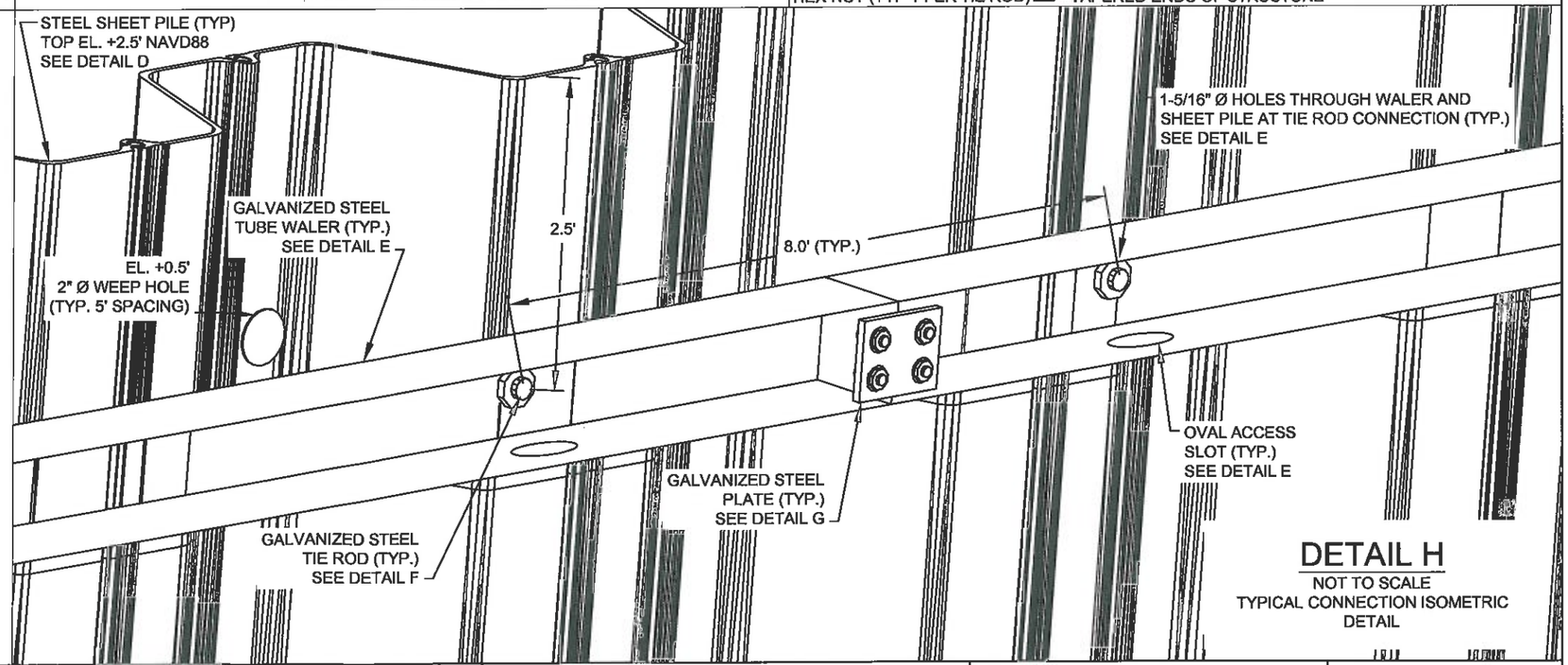


DETAIL F
NOT TO SCALE
GALVANIZED STEEL TIE ROD

NOTES:
1. FASTEN TO WALER USING FOUR ¾" Ø A307 GALVANIZED BOLTS, NUTS, AND WASHERS.
2. SPLICES SHALL BE MANDREL BENT AND INSTALLED ON ALL ANGLES IN THE SHEET PILE ALIGNMENT.
3. TIE RODS SHALL NOT PENETRATE SPLICES.
4. SUCCESSIVE WALER TUBES SHALL BE SECURED EVENLY BY BOLT PATTERN.



DETAIL G
NOT TO SCALE
GALVANIZED STEEL WALER SPLICE DETAIL



DETAIL H
NOT TO SCALE
TYPICAL CONNECTION ISOMETRIC DETAIL

STATE OF LOUISIANA
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COASTAL ENGINEERING DIVISION
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

DRAWN BY: SHANE FAUST | DESIGNED BY: SHANNON HAYNES, P.E.

LAKE BORGNE
SHORELINE PROTECTION

STATE PROJECT NUMBER: PO-30
FEDERAL PROJECT NUMBER: PO-30
APPROVED BY: LUKE LE BAS, P.E.

SHEET PILE DETAILS

DATE: FEBRUARY 2007
SHEET 34 OF 34